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Early American Glass

Early American Glass

By

Rhea Mansfield Knittle

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INTRODUCTION

In endeavoring to trace the history and development of any of the native American arts and crafts, the student is under certain peculiar difficulties and must necessarily run into many a cul-de-sac. Our early chroniclers accorded scant attention to the arts or to industrialism. They celebrated no Sellews, no Saverys, no Stiegels; they paid no homage to the master workers in metal, wood, or textiles. The potter and the glass-maker were cast aside like their broken pots, while the explorer, the soldier, and the politician were lauded to the skies. In particular, the subject of early American glass is without doubt the most obscure and also the most uncertain, illusive, and deceptive in the entire field of Americana. At the same time, its very obscurity and illusiveness have served to pique curiosity and to stimulate research; and in recent years a small but persistent group of collectors and special students have been delving deep into the ruins of old glass-houses, into the records of historical societies, contemporary newspaper files, and other promising fields of source material, in an effort to shed light upon this subject.

In offering the present volume, I make no apology for its imperfections, knowing as I do that a complete or flawless book on American glass cannot yet—if, indeed, it ever can—be written. I know also, from long experience, that authorities on glass will never abso-

lutely agree, but will frequently hold diametrically opposite opinions on many phases of the subject. What one will accept as proof positive, another will reject as vague theory, and each be perfectly sincere in his conviction. Mankind, which refuses to think concertedly on fundamentals pertaining to systems of religion and government, will never come to a perfect accord in less momentous matters. Those of us who attempt to write upon this and similar subjects in America are more or less pioneers, possessing the love of adventure and the zest for far horizons; possessing also the limitations which encumber such workers, yet perforce going on, blundering and stumbling, in the hope that those who follow may build upon such meager and fragmentary foundations as we are able to establish.

Heretofore, in books dealing with American glass in general, three makers or houses have been stressed, to the almost complete exclusion of the many others, until a layman would be justified in concluding that our early glass product, like all Gaul, was divided into three parts—Wistar, Stiegel, and Sandwich. Each of these three was of far-reaching importance, yet the time has come when other makers also must be given a place in the sun.

Under the spell of the tripartite classification above mentioned, nearly all of our glass made before 1830 was until recently termed either "Wistarberg" or "Stiegel." Then the pendulum suddenly swung the other way, and there are now certain persons who scoff at the assumption that any known piece of glass could by any possibility have originated in the furnaces of either Wistar or Stiegel. A happy medium between these two extreme views would seem to be closer to the truth.

In the interests of lucidity and readability, I have tried to avoid the use of too many technical terms; yet these, like statisics, cannot be wholly eliminated. The mechanics and processes of the trade also refuse to be entirely cast aside. The novice speaks one language, the connoisseur another; and between these two I have tried to strike a medium suited to the general reader's comprehension.

The spelling of proper names has undergone many transitions since the beginning of the industry. In addition, new counties, even new States, have been formed, thus still further confusing the matter of nomenclature. Wherever possible, in the case of variant spellings, I have given both the old and the new forms. But in such an instance as that of "Evert Duÿcking," where documents in the New York Historical Society library record the name in seven different spellings, I have adhered to the form used by the man himself in his own signature.

Although American glass is collected and called antique which was made after 1865, it is inexpedient, for more reasons than one, to make mention of the houses founded after that year. Antique furniture ceases to be such in England at one period, in New England at another. Old pottery is measured by entirely different time-lengths in China and in Vermont. Desirable old glass made in Italy and that made in Kentucky are separated by centuries. The term "antique" is wholly relative.

In the following chapters it has been impossible, within the allotted space, to treat at great length of individual houses, or to go into detail regarding particular types of glass; but I have attempted to collect and collate such scattered and generally fragmentary data

as exist, into a consecutive narrative covering a span of more than two hundred and fifty years.

I have broken away in this work from a good deal of traditional classification, being led to that course by (1) my own personal researches, (2) the opinions of those who are close students of early American glass, and (3) the recent statements of several writers who realize that they had previously made certain errors in the arbitrary classification of our early glass—errors which were seldom due to carelessness on the writer's part, but which resulted from the nebulous atmosphere surrounding the subject of our early endeavors in glass-making.

The method, here adopted, of treating the subject of early American glass more or less chronologically, and by locality, is the only possible one for a volume dealing with that subject in general. The time will soon come, however, when our glass can be treated in comprehensive monograph form, or by certain outstanding types. New information regarding early industries is being gained so rapidly, old theories are being so frequently upset, that a period of several years must yet elapse before attributions can be properly authenticated and types standardized.

Aside from its main purpose, I hope this book may somehow serve to foster among students of American history, antique-collectors and dealers, present-day glass-manufacturers, and even the general public, a larger understanding of and a genuine homage for those early American craftsmen whose lights have too long been hidden under a bushel. Personally I have acquired a great respect for these artisans. The casual outsider, uninterested in our infant industries, cannot vision the mountain of difficulties which loomed

large and forbidding before our early glassmen. The handicaps were many. Commercial depression, wars, pestilence, fire, an almost total lack of assistance or encouragement from official sources, coupled with apathy and a want of appreciation on the part of the general public—these and many other obstacles, such as poor sand and the migratory tendency of the workmen, beset the managers of the little furnaces. The encouragement given the Oriental and European artisans by their guilds and trades societies, or by royal and aristocratic patronage, was rarely if ever in evidence in our provinces, or later in the States. Negotiations with a General Court, for financial aid, seldom proved successful; and if they were successful, there was usually a qualifying stipulation which virtually nullified the proffered aid. We had no Dandolos, no Dukes of Buckingham to foster our arts; and as the members of the guilds from overseas ventured to our shores in search of religious or political liberty, or of fortune, they found their fellow-men so occupied in the colonizing process, that the craftsman was for the most part left alone to worry along as best he could.

These are but a few of the reasons why the annals of early glass-making in America are so full of pathos; why ultimate commercial failure was blown into nearly every example of the metal made before 1814; even in the great plate-glass industry of later years not one piece was turned out before 1880 without financial loss.

In considering our native glass, a few reservations and a large tolerance are therefore needed. By casting aside darkened spectacles, we can grasp the whole vast forward sweep of events. Clarity once gained, behold our more or less primitive endeavors surrounded with a new glamour! For the significance of an inner meaning

will have dawned upon us. In retrospect we can see these early fashioners of glass, men from the war-torn regions of Europe,—Bohemians, Venetians, Dutchmen, Englishmen, Irishmen, Germans,—bringing the splendid though somewhat worn traditions of their Old World into the invigorating atmosphere of the New. And as the fairy fantasies in glass which had birth at Murano and the sturdy *Krautstrunk* of the Low Countries clashed with the elementals of our primeval state, a something different emerged—contact with elementals never leaving a thing the same. So, up and down our Atlantic seaboard and later in the mid-Western district there evolved types of glass much after the manner of the parent examples, yet embodying an intangible, almost inexplicable, difference in texture, form, and decoration, which has marked them for our own. And we love our own.

ACKNOWLEDGMENTS

One of the pleasures in the preparation of this volume has been my association with many friends who, prompted by a desire to further the cause of historical research in connection with our native glass-industry, have voluntarily given me various kinds of help. These men and women have motored me to the sites of abandoned glass-houses from Vermont to West Virginia; they have secured books, reports and pamphlets for me which are out of print; they have furnished photographs of certain examples of glass with which to illustrate portions of the text. The editorial and business staffs of "Antiques" and "The Antiquarian" magazines have constantly come to my aid. The curators and librarians of museums and historical societies have at all times been courteous and obliging. The editors of newspapers and glass-industry trade journals and the heads of several present-day glass manufactories have given prompt help when I have sought it. The staff of the research room of Carnegie Library of Pittsburgh, and the curators and their assistants of the Metropolitan Museum of Art, New York, and of the Toledo Museum of Art have been of special assistance to me.

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CONTENTS

Part I: Essential Data Concerning Early Glass

CHAPTER		PAGE
I	What Is Glass?	3
II	The Beginnings of Glass	12
III	Processes and Tools of the Trade	19
IV	Molds and Mold-Makers	26
V	Attribution and Authentication	36

Part II: The Earliest Beginnings in America 1609–1737

VI	In the Days of Our Youth	45
VII	The First Jamestown Venture	52
VIII	The Second Jamestown Venture	57
IX	The Salem Glass House	63
X	Johannes Smedes, of Glass-Makers Street, New Amsterdam	67
XI	Evert Duÿcking, Artist and Artisan. Earliest Experiments in Pennsylvania and New Jersey	72

Part III: The Second Period, 1737–1827

XII	Conditions of the Times	79
XIII	Caspar and Richard Wistar	84

Contents

CHAPTER		PAGE
XIV	The Lee and the Braintree-Quincy Endeavors	101
XV	The Bamper-Bayard Undertakings	107
XVI	Stiegel and the Manheim Industry	118
XVII	The Stiegel Output	135
XVIII	Kensington and "Doctor" Dyott	144
XIX	Glassboro, New Jersey. The Stangers and the Whitneys	152
XX	Robert Hewes and the Experiment at Temple, New Hampshire	159
XXI	The Dowesborough, Hamilton, and Sand Lake Works	164
XXII	Amelung and the New Bremen Community	172
XXIII	Early Massachusetts Houses	181
XXIV	The Pitkin, Coventry, and Other Connecticut Houses	192
XXV	Albert Gallatin and the Kramers	202
XXVI	O'Hara & Craig of Pittsburgh	208
XXVII	The Second New Jersey Group	217
XXVIII	Saratoga and Other New York State Houses	229
XXIX	Salisbury and Other Vermont Houses	236
XXX	Keene, New Hampshire	242
XXXI	The Monongahela River Houses	249

Contents

Part IV: The Third Period, 1827–1864

CHAPTER		PAGE
XXXII	The Expansive Era	257
XXXIII	Our Emergence into the Mechanical	264
XXXIV	The New England Glass Co.	274
XXXV	The Boston and Sandwich Glass Company	282
XXXVI	The Federal Hill and Spring Garden Works in Baltimore	297
XXXVII	Bakewell's of Pittsburgh	307
XXXVIII	Frederick Lorenz and William McCully of Pittsburgh	317
XXXIX	The McKees and James Bryce of Pittsburgh	323
XL	James B. Lyon of Pittsburgh	331
XLI	Other Pittsburgh Houses	336
XLII	The Third New Jersey Group	351
XLIII	Stoddard and Other New Hampshire Houses	366
XLIV	Zanesville, Ohio	372
XLV	Other Ohio Houses	379
XLVI	Knox & McKee of Wheeling	389
XLVII	The Wheeling-Martin's Ferry Group	394
XLVIII	The Wellsburg, West Virginia, Houses	401
XLIX	Later New York State Houses	406

Contents

CHAPTER		PAGE
L	The Kentucky Glass Works . . .	414
LI	A Few Scattered Houses . . .	421

Part V: Two Hobbies of the Collector

LII	Some Notes on Cup-Plates . . .	427
LIII	Some Notes on Bottles . . .	438

Appendix

	Bibliography	449
	Glossary	455
	Index	459

ILLUSTRATION PLATES

BETWEEN PAGES 72–73

1 Brilliant opalescent insufflated (three-section contact blown-mold) pitcher—1820–38. Attributed to New England Glass Co.

2 Types of early glass made from poor grades of silica—1750–1820.

3 Authenticated large green Pitkin demijohn. Heavy coarse bottle dug up near Wistar's works.

4 Nine types of wine-glasses made by various American glass-houses, after European prototypes—1768–1830.

5 Authenticated Wistar reddish-brown bowl on footed standard—1760–70.

6 Authenticated Redford reamed-edge bowl. Heavily reamed-edge milk-bowl attributed to Gallatin & Nicholson. Flaring-edged pan attributed to Amelung. Sloping-sided bowl attributed to Wistar.

7 Mahogany mold models salvaged from Sandwich factory (one of the few extant)—1850–70.

8 Four types of engraved flint-glass first introduced by Bayard-Bamper or at Manheim, but also made at other early flint-glass works—1769–1838.

9 Group of cobalt flint-glass with heavy cobalt rims. Made near Pennsylvania-Maryland border—1769–1830.

10 Travelers' bottles formerly encased in wicker. Types of snuff and apothecary jars. Gimmal, or two compartment, bottles. (All these types made at numerous glass-houses.)

Illustration Plates

11 Four exceptionally fine pitchers, all Eastern types, whose technique migrated westward—1769–1830.

12 Remarkable large cobalt flint covered blown bowl. Probably Stiegel.

13 Four types of enameling as practised by Stiegel's workmen, at Manheim and probably at other houses.

14 Excellent example rigaree decorated gimmal-bottle, attributed to Olive or Harmony works, Glassboro. Authenticated Medford cobalt bottle. Ohio River types of light-green pitcher and purple cruet.

15 Examples evidencing South Jersey technique: crimped handle, foot, superimposed body, plastically applied threads about neck. Colors: Emerald, dense amber, ultramarine, light green. Attributed to Redwood, Stoddard, Millville.

16 Light-green "offhand" blown jar and pitcher—authenticated Sand Lake. Probably blown by Gabler brothers.

BETWEEN PAGES 168–169

17 Ludlow bottles collected by Miss Evanore Beebe—1812–30.

18 Rare types—candlesticks and lamps.

19 Clear flint-glass geometrically patterned insufflated types—large bowl, sugar-bowl, and vases. Attributed to Massachusetts.

20 Very fine opalescent wash-bowl—1820–45. Attributed to Massachusetts.

21 Golden-amber perpendicularly ribbed expanded quart "Granddaddy" flask attributed to Panhandle and southern Ohio section. Upper group: Pitkin type swirled and fluted flasks with superimposed bodies; also made at Keene and in mid-Western district. Lower groups: Stiegel hip-flask types made by Eastern workmen in many mid-Western houses.

22 Cobalt insufflated pitcher, attributed to Sandwich, and two clear-glass insufflated geometrically patterned pitchers. Central pitcher made from very low-grade silica; largest one from high-grade silica.

23 Red-lead flint cut glass after Waterford manner: No. 1, authenticated New England Glass Co.; Nos. 2 and 3 attributed to Fisher and Gillerland after they left the Cambridge plant and went to New York.

24 Fine iridescent green geometrically patterned decanters, with rayed stoppers. Attributed to Keene, Kent, or Zanesville.

25 Four distinct types of sugar-bowls: (1) Insufflated method. (2) Expanded diapered method. (3) Plain-surfaced blown bowl. (4) Cable design on blown bowl. Exact attribution of each precarious.

26 Baroque and geometrical examples of clear insufflated glass. No. 2, blown in a four-part mold, not three, attributed to Amelung.

27 Wm. H. Harrison Log Cabin with Flag pint flask; very rare. Attributed to a Monongahela or Ohio River glass-works.

28 Authenticated Columbia, N. J., "offhand" blown plate. Authenticated Suncook, N. H., large bluish-green bowl. Citron bowl attributed to Greensboro, Pa. Footed bowl attributed to Lancaster, N. Y.

29 Types of "offhand" glass emanating from South Jersey, New York State, upper New England, and Zanesville houses. No. 3, authenticated Lyndeboro, N. H.

30 Rare ribbed, slightly fluted expanded golden-amber bowl. Brought from Fredericktown, Maryland, to Ohio in 1817.

31 Blown base of pressed bowl. Pressed base of pressed bowl. Three-molded bases of insufflated salts. (Note divergence of design.)

32 Types of bottle blown at nearly every cylinder and bottle glass house. No. 2, Stiegel straight-sided swirled type; No. 3, Pittsburgh expanded type; No. 4, globular expanded Zanesville type; No. 5, heavily collared mouth Kent-Ravenna type. Nos. 6–12, amber and green hip-flask types, with swirls running in both directions; Panhandle type.

Illustration Plates

BETWEEN PAGES 264–265

33 Vari-patterned clear-glass insufflated plates and saucers. Attributed to Massachusetts flint-glass houses.

34 Types of glass made at mid-Western houses, found in amethyst, cobalt, amber, green, and clear glass.

35 Very rare cobalt insufflated vases and cobalt baroque-patterned decanter. Attributed to Massachusetts flint-glass houses.

36 Whorled or striated bicolor and tricolor effects. Made at nearly every flint-glass works, 1820–60.

37 Heart-pattern pressed bowl, slight greenish tinge. Seven-inch pressed plate, heart-and-shield pattern. Light amethyst pressed compote. Pressed compote with blown base. All New England Glass Co.

38 Various types of tumbler: (1) Rare tulip-engraved, paneled Stiegel type. (2) Beatty & Stillman clear-glass tumbler. (3) Cobalt Bakewell paneled tumbler. (4) Brownish-yellow New Hampshire example.

39 Authenticated Mountain Works, Saratoga, clear-green wash-bowl and pitcher. Fine emerald-green examples embodying same South Jersey technique.

40 Marked "Keen" Sunburst. Eagle canteen—rarely marked "N. G. Co." or "N. G. & Co." Expanded-mouth olive-green Washington, Taylor flask, probably used for snuff. Zanesville "Masonic" type.

41 Massachusetts lamps—blown and pressed. No. 3, "Peg" Lamp; No. 6, wine-glass type; No. 10, expanded bowl on pewter base and standard.

42 Mid-Western clear-flint sugar-bowl. Rare green swirled and fluted, expanded bowl attributed to Greensboro, Wellsburg, or Zanesville.

43 Marked "H. Clay" Engine and tender salt. Marked "N. E. Glass Co. Boston" salt.

44 Christmas-tree light—1769–1830—Pennsylvania and New Jersey. Jacony basket—1769–1835—Stiegel and Massachusetts. Early type

of ball. Grass-green hearth tile made by Kearns. Butter-mold made by McKee and Brothers. Insufflated hat toothpick-holder—Massachusetts.

45 Top row: Purple, cobalt, clear-glass perfumes made in two-part molds. Sea-horse tricolored Millville type perfume. Lower row: Four American copies of French unguent-bottles.

46 Rare lamps in Mr. Henry Ford's collection. Pressed five-step bases, blown and engraved fonts and globes. Attributed to Sandwich.

47 Pressed tea and toddy plates and compote. Authenticated New England Glass Co.

48 Marked Knox & McKee "Lafayette, Eagle" flask. Monongahela River type of Washington Eagle flask. "Inverted Cornucopia, Eagle" flask. Albany (Hamilton) Glass Works flask. (Four types prior to 1835.)

BETWEEN PAGES 392–393

49 Marked Providence, R. I., salt. Kensington ink. Marked Pittsburgh boat salt. Olive-amber Keene ink. Cobalt Lyon salt. Cobalt Sandwich ink.

50 "Offhand" glass from Redford factory, light green with turquoise tint; balls, clear glass with colored powder blown into them.

51 Enameled opalescent Pittsburgh Mug, South Jersey type (1840). Opaque pitcher, South Jersey type (1830). Opaque and clear glass goblet, South Jersey type (1830) but made at many other factories. Opaque lamp—Massachusetts.

52 Dense-amber Saratoga glass.

53 Iridescent green "Kossuth" calabash—Kensington. Ravenna or Whitney "Jenny Lind" calabash. "Eagle, Free Trade and Sailors Rights" flask. Cobalt "Liberty Head, Eagle"—marked "Union Co" Kensington flask.

54 Fine amethyst, purple, amber, citron, emerald, light-blue, cobalt, canary, blue opaque and marbled candlesticks—1820–50.

55 Mid-Western hotel and river-boat equipment—1835–65.

56 Marked "Union and Clasped Hands" flasks made at various Pittsburgh houses; found in wide range of colors.

57 Miniature paper-weight. Half-section of weight, showing relative smallness of design. Green doorstop with silvery decorations. Fine example of weight made by William T. Gillinder, Philadelphia—1850–65. Weight with base cut off to show method of introducing varicolored canes.

58 "Thirteen Hearts"—New York origin. "Bunker Hill"—Sandwich origin. "Rose and Pansy"—Pittsburgh origin. "Chancellor Livingston"—Sandwich origin. "Fort Meigs, Tippecanoe"—Pittsburgh origin. "Fort Pitt Eagle"—Pittsburgh origin.

59 Exceptionally fine metaled candlesticks. Type made by Jarves, Lyon, Adams, Cunningham, Hobbs-Brockunier.

60 Toddy-plates, between four and five inches in diameter. New England Glass Co.

61 Extremely rare circular Robert Fulton cup-plate. Attributed to a mid-Western house.

62 Marked McCarty & Torreyson "Violin" type. Jenny Lind "Violin" type—Riverside Glass Co. "Corseted Violin"—probably Pittsburgh. Louisville "Scroll" or "Violin," quart size. Common type made at many works, pint size. Fleur-de-lis "Scroll" or "Violin," half-pint size.

63 A. & D. H. Chambers bicycle flask (late). Rarest of all flasks (only one known), Frederick Lorenz "G. G. Washington, Eagle." "Eagle, reverse Eagle" flask, made at Louisville, Zanesville, Wheeling, Pittsburgh, Martin's Ferry, Lockport, and other houses. Two Ravenna flasks (late).

64 Glass patterns from the McKee catalogue.

PART I

Essential Data Concerning Early Glass

Early American Glass

CHAPTER I

WHAT IS GLASS?

The sand gives the glass, the soda makes it melt, and the lime gives it nature.—NERI.

THE word glass was probably derived from the old Teutonic root *gla*—which carries the general sense or idea of "gleaming" or "shining." As Neri said, glass is sand, with a melting or fluxing ingredient added to it, and a bit of lime or of other constituents thrown in to give quality, texture, tone, ductility, life, weight, or brilliance. In non-technical language, glass is commonly defined as a hard substance, usually transparent or translucent, which from a fluid condition at a high temperature has passed to a solid condition with sufficient rapidity to prevent the formation of visible crystals. The generally accepted chemical explanation in regard to the structure of glass tells us that it is "a quickly solidified solution, in which silica, silicates, borates, phosphates, and aluminates may be either solvents or solutes, and metallic oxides and metals may be held either in solution or in suspension."

Sand, the basis of all clayey soils, is known as silica, and a silicate is a chemical compound formed when this sand is combined with an alkaline substance such as lime, soda, or potash. (In its pure form sand is quartz, and in this form is the main constituent of

the sands of the sea, and of all the rocks called sandstone.) The natural varieties of silica are rock-crystal, amethyst, agate, onyx, and jasper. In its crystalline form, silica is hard enough to scratch glass itself, being used for this very purpose in certain sand-blast processes. While it is fusible only at a very high temperature, it readily combines with alkaline substances, forming what are termed soluble silicates, or water-glass, because such silicates quickly dissolve in hot water.

Crystal glass is frequently confused with rock-crystal, even by some glass-manufacturers in their advertisements. One is made by man, the other by nature. Rock-crystal has a crystalline structure, while the composition glass is amorphous. Obsidian is a volcanic manifestation of fusion, and was held in high esteem by our American Indian tribes.

In the making of glass, potash and soda in combination tend to increase fusibility, while alumina retards it. Lead adds luster and sheen, increases fusibility, heightens refractory power, and adds weight. Because of the large proportion of lead in its composition, the English-Irish flint-glass imported into America after 1783 was very durable; consequently a good deal of it has survived. This is also true of portions of our Massachusetts, Brooklyn, and Pittsburgh flint-glass output. Soda-lime predominated in Venetian glass, potash-lime in Bohemian, but potash-lead prevailed in the English, Irish, and American flint.

Glass is characterized by brilliance, hardness, smoothness, and (in a viscous state) ductility. At a high temperature of fluidity it can be stirred, ladled, poured, and cast; in a viscous state it can be rolled like dough, with an iron roller; it can be rendered hollow

by the human breath or compressed air; it can be forced, by air-pressure or by a mechanically driven plunger, to take the shape and impression of a mold; it can be extended almost indefinitely as a solid rod or a hollow tube, or drawn into thread sufficiently fine to be woven into a fabric.

Nearly all glass has the following common properties: it passes through a viscous stage while cooling; it develops color effects when the fluid mixture is fused with certain metallic oxides; when cold it is a poor conductor of either heat or electricity; it is easily fractured by a blow or a shock, and in such cases shows a conchoidal fracture; it is only slightly affected by ordinary solvents but is readily attacked by hydrofluoric acid. Glass has also certain peculiar properties. It is extremely brittle; it may be worked to such a degree of thinness that it will float in the air; in ductility it ranks next to gold; its flexibility is remarkable; and it is extremely elastic. No metallic condenser possesses an equal strength with one of glass; fog and dew affect the surface of glass, while they do not affect that of other compositions; the vibrations of a glass bell extend farther than those of a metallic one.

A century or so ago, when much of the output to be considered in the present volume was produced, glass was commonly classified as (1) flint or crystal; (2) crown, or German sheet; (3) broad, cylinder, or common window; (4) bottle, or common green; and (5) plate. To-day the standardized classification runs as follows: (1) optical; (2) blown, covering table, tube, sheet,—or crown,—and bottle; and (3) mechanically pressed, covering plate or rolled plate, and pressed tableware. Our immediate interest is mainly in bottle-glass and flint-glass.

The large percentage of metallic oxide used in flint-glass is its distinguishing characteristic, the composition varying somewhat according to whether it was melted by wood or by coal. If wood was used, the crucible or pot was without a cover, giving more time to the oxidation process. The use of coal as fuel required a covered pot. Nearly all of our early glass was melted over a wood fire; coal was first employed as fuel in glass-making late in the eighteenth century, by O'Hara & Craig at Pittsburgh, and until 1810 the Pittsburgh district was the only section in the country where coal was thus used.

The typical formula for flint-glass was as follows:

Sand, washed and burned	3 cwt.
Red lead or litharge	2 cwt.
Carbonate of potash	1 cwt.
Saltpeter	14 to 28 lbs.
Oxide of manganese	4 to 12 oz.

As far as is known, flint-glass was first made in America from calcined or pulverized flints found along the shores of bodies of water. This material was later superseded by fine sand or quartz. In preparing flint-glass, a quarter in bulk of broken glass, or "cullet" (as it was called), was added to the "batch" in the fusing pot. Numerous advertisements for cullet, in the newspapers of Boston, New York, and Philadelphia, attest to the wide-spread use of this material. The price generally paid for it was one penny a pound for old green or bottle glass, and twopence a pound for broken flint.

Our bottle-houses in the first, and in portions of the second and third periods, used for the most part

a lime base; while potash was employed in the "melt" for the apothecary or "chymical" wares, rendering this glass more clear.

Green or bottle glass is coarse in texture and varies greatly among the different bottle-houses. It is a silicate of lime, soda, alumina, and iron, the last two ingredients being found as impurities in the sand itself. These impurities are usually due to an admixture of clay, loam, gravel, or organic matter, and are the bane of the glass-maker. While they can be almost entirely eliminated by proper washing and burning, many of the early bottle-houses did not go to this trouble. The quality of the sand varied greatly in different sections of our country, and Connecticut, early Pittsburgh, and other bottle-houses encountered many difficulties on this score, while the desirability of a large portion of our 1830–64 table-glass was partially due to the fact that the sand used in its composition contained so little iron.

Much of the sand used in glass-making occurs in the form of sandstone, which is quarried in blocks and then crushed and prepared for use. Our earliest glass, however, was made from river or sea sand, rather than from quarried or mined silica. For the making of good glass, sand should be perfectly white and not very fine. The grains should be uniform, and angular rather than rounded; and it should not effervesce. The superiority of America's sand-beds is universally conceded, the best silica for the making of our early glass being found in Juniata County, Pennsylvania; around Maurice River, New Jersey; in the Berkshires, New York; at Wills Mountain, Maryland; in Hancock County, West Virginia; at the mouth of the Scioto River, Ohio; along the Fox River in Illi-

nois and near Crystal City, Missouri. The Hancock County supply was 99.90 per cent pure silica, which accounts in part for the numerous glass-houses which sprang up in that vicinity. The Cincinnati, the Louisville, and some of the Pittsburgh houses used Missouri sandstone, Crystal City turning out seventeen or eighteen hundred tons each month, shortly after the Civil War.

In 1792, glass-making the world over received a decided stimulus in the process discovered by Nicholas LeBlanc of France, by which he supplanted the use of impure sodas (the supply of which was limited and uncertain) with the use of soda-ash, or carbonate of soda, whereby chloride of sodium (common salt) was converted into soda. This also tended to lessen the cost of production. In 1863, the ammonia process was made the object of experimentation; and in 1866, Ernest Solvay began the manufacture of soda by the use of ammonia, at Brussels, Belgium. This further cut down the cost of glass-production. The supply of nitrate of soda used by our manufacturers during the eighteenth century came almost exclusively from South America.

Arsenic is used in glass-making to remove the organic matter that carbonizes in the pot while the metal is melting, and is called "the great decarbonizer"; while manganese, the glass-maker's soap, serves the purpose of "the great decolorizer." Glass containing manganese is, however, more prone to discoloration from exposure to the sun than glass which lacks this ingredient. After the discovery of Missouri clay, this latter was found to be the best medium for freeing glass of sulphate of iron.

In order that the purplish tinge of glass, resulting

from exposure to the sun's rays, may be avoided, examples should never be placed in or near a window with a southern exposure. The solar rays reduce the colorless peroxide of manganese in crown or flint glass to a purple binoxide. If you wish to retain the pristine condition of your collection, be careful about placing any fine glass in a window for long at a time. Glass discoloration has interested chemists since 1823. In 1881, Thomas Gaffield, of Boston and Salem, found after exhaustive experimentation that nearly every piece of glass exposed to the rays of the sun for ten years changed in color; that diffused light also will discolor glass, but with diminished effect; that there comes a time when color action stops; that amber, olive, blue, and purple glass, when exposed continuously to sun-rays, change to a darker tone; that brown generally takes on a purplish tinge, yellow a greenish tinge, and greenish white becomes bluish white. Glass demands respectful and considerate treatment.

"Sick" glass is a result of superficial decay. Glass is sensitive to the elements and to other influences which cause deterioration and disintegration. When the lodgment of foreign particles is secure, decomposition is rapid. In other cases centuries pass before damaging inroads are made upon the surface. On blown glass in particular, this disintegration tends to result in a scaly formation; at other times the glass is covered with tiny fissures which intersect one another. This attack may be from within or without the vessel, depending upon conditions. If a piece of glass has been buried beneath the soil, the erosion may be both inside and out. Ancient glass has fortunately been given a marvelous iridescence and luster by centuries of burial, but our nineteenth-century bottles and flasks

have been greatly damaged from without by exposure to the elements, or from within by burial in the soil or by various medicines and acids which have bitten into the metal. Glass, having a great affinity for moisture, is inclined to condense water on its surface; this in turn absorbs the carbonic acid abounding in air and soil, and in time draws the sodium and the potassium from the glass, leaving a disintegrating silicic acid sticking to the surface in the form of a dull coating of infinitesimal scales. It is virtually impossible to cure "sick" glass.

Little is really known about the theory of coloration in glass beyond the fact that certain materials, generally metallic oxides, added to and melted with certain glass mixtures, will produce various effects in color. The parent color is oxide of iron (iron-rust). It is found in reds, blues, greens, and violets. The achievement of perfect ruby has proved one of the greatest problems in glass-making. In many countries ruby was the one unknown or unattainable color effect. Requiring exactly the right amount of gold-leaf to the mix, its production caused more annoyance to the color-mixers than any other chemical process with which they had to contend.

In Deming Jarves's "Reminiscences of Glass Making," one may find interesting notes for colorings which were used by the Boston and Sandwich Glass Company's chemists. In 1849, Apsley Pellatt published a set of formulæ by application of which the best color results could be obtained in the making of flintware. Fundamentally these formulæ are very similar to those employed by our present-day glass-makers.

Opaque glass, made almost continuously since ancient times with the exception of a few centuries

during the dark ages, became very popular in America. The English Bristol opaque differed in several respects from most of the opaque glass made in our country. It is a solid white, clear, even, rich in tone. It is never yellowish. When held against the light it is semi-transparent to about the same degree as Chinese porcelain; it is fairly heavy; it never assumes a bluish shade around the edges. The American opaque glass generally gives forth a ruddy glow when held against the light; it is at times streaky and cloudy; it is generally thinner than the English, is extremely fragile, and takes on a bluish tinge around the edges. Both English and American opaque glass are easily shattered.

There will always remain an element of the marvelous about glass. That such constituents as sand, soda, and lime or lead can be fused and, almost by magic, turned into this beautiful transparent something which we call glass, is in itself remarkable.

CHAPTER II

THE BEGINNINGS OF GLASS

When Pliny, Josephus, and others of the ancients radically disagree regarding the origin of glass-making, it seems permissible for us moderns to draw our own conclusions. None of the early theories are impossible, but all savor of the improbable. In all likelihood, however, the discovery of what we call glass was accidental.

Pliny relates that Phenician sailors, landing on the sandy bank of a little river in Palestine, built a fire under their cooking-pots, supporting their utensils upon lumps of natron (native sesquicarbonate of soda), and that when the fire had spent itself they found the sand and natron had so fused as to produce a transparent metal. The weak point in this story lies in the fact that such a fire would probably lack a sufficient degree of heat to produce fusibility. Josephus tells us of a great forest fire near the seashore, the intense heat from which melted the sand, leaving lumps of the substance known to us as glass. The Society of Glass Technology has recently announced that the well-known archæologist, Sir Flinders Petrie, has evidence sufficient to prove that as far back as 2500 B.C. glass-making was practised in Mesopotamia, the principal output being beads, which were not blown but fabricated from a pasty substance quite different from the molten metal ladled from the modern glass-pot.

The making of the glass-matrix and the art of blowing glass were not simultaneous or coincident developments. Bubble-blown glass is a slow and gradual evolution from the core-wound, spun, and pad methods. A continuous interchange of the arts was taking place between Syria and Egypt at the period when glass was developing into decorative forms; its manifold utilitarian usages were undreamed of for centuries.

Syria was the home of a high degree of culture before the ascendancy of Rome or Alexandria, and the Syrian methods of glass-manipulation, after glass had attained decorative forms, is supposed to have been carried into upper Egypt by captive Syrian craftsmen. The Sidonians, the Chinese, and the Mesopotamians produced imitations of precious and semi-precious stones. The Sidonians became so expert in imitation that their bits of blue and green glass have more than once in our day been mistaken for rare jewels.

The two and three part molds were apparently the inventions of these peoples, and were probably made of copper. The distinct characteristic of early Sidonian and Jewish glass is that it was two or more sided, instead of rounded or spherical. While the existing Sidonian pieces frequently bear an impression of a goddess or a faun, the Jewish imprints are symbols of the Hebrew faith and are generally six-sided. The extant examples of both are very beautiful, the patina created by the erosion of time and long burial in the earth giving them an exquisite iridescence and play of color quite beyond the art of man to reproduce.

Egypt developed a glass-industry which to the student is intensely interesting, although it may have been brought from other lands. As Egypt went her conquering way among the other nations of the ancient

world, she showed a consistent respect for the arts of her captives, assimilating and absorbing as she mingled with other civilizations; and during the era of intercourse with Greece and Rome an astounding variety of articles were blown or molded by her glass-makers. Here the use of mosaic attained a perfection never since surpassed in glass; while her triumph of all colors, Nile blue, has never been rivaled. This color, which Pliny called the most beautiful in the world, is said to have been compounded with the greatest care by one of the Egyptian kings, Thothmes III.

The Saracenic invasion of Syria and Egypt did not destroy the early Christian or Byzantine art; glass-making flourished under the rule of the Saracens in Tyre, Tripoli, Cairo, Aleppo, Alexandria, and Damascus. Their enameling and gilding were of remarkable beauty, and their mosque lamps were specimens of handiwork compared with which the enameling of our Dutch and German-born American glass-workers is crude and amateurish.

Persia did not acquire an early outstanding glass-culture, although she may have been the first to use gold as a method of decorating her fragile blue ware. India had its ancient glass, our knowledge of which is so slight as to be little more than deductive. The body of the glass is said to have contained particles of broken rock-crystal, and was consequently of high merit from the metallic standpoint. On the other hand, very old fragments unearthed in the Punjab show no traces of crystal. In more modern times, Delhi had a flourishing glass-industry.

China evidently did not feel the necessity for glass-making. The art of porcelain-manufacture was here of such excellence that it served the esthetic needs of the

people, while pottery met those utilitarian demands to which our cruder forms of glass were adapted in the eighteenth century. However, the Emperor Wu-ti, of the Han dynasty, in 140 B.C. was patron of a glass-factory, while Tsaou-tsaou received gifts of glass from the West (probably Egypt) and is said to have henceforth fostered a glass-industry.

As classicism opened its beautiful portals, in the Greco-Roman era, glass became an adjunct to architecture; and in the Golden Age of Pericles, at which the whole world marveled, glass became a handmaiden to the greater art and served it well. In Athens were glass floors, ceilings, and side-wall panelings; and later, in Rome, glass was used in the construction of the Roman baths. The Romans carried glass into Asia by way of Byzantium, and into Gaul; fragments of their transplanted wares have been unearthed in our day. But, whereas after Italy's invasion by the barbarian hordes from the North, in the fifth century, the art of glass-making slumbered in northern and central Europe and during the Middle Ages was almost extinguished, the southern lands more or less sporadically kept it awake. It was but natural that it should reach its revival and florescence under Italian skies.

At the peak of Rome's artistic creativeness, her glass-makers produced remarkable imitations of onyx and porphyry. They mastered nearly every form of glass-decoration; they excelled in the cameo method of ornamentation and in the handling of delicate superimposed types. Their manner of glass-cutting was more suitable to the material than some of ours has been, and they used every color but ruby, employing a wide range of blues. It is one of the lamentable circumstances in the rise and fall of nations that an art which

had reached such a stage of excellence should have almost sunk from sight in the depression brought about by indulgence and war. And it is remarkable that a few passed on the torch which eventually lighted the fires under the Venetian furnaces to flare up in a glorious recrudesence.

Spanish glass dates from ancient times in the Iberian Peninsula, after it was colonized by the Carthaginians and Phenicians. Barcelona was founded or rebuilt in 225 B.C. by Hamilcar Barca, a Carthaginian; Cadiz by Tyreans in 1100 B.C.; Seville was Rome's greatest city in Hispania; and Toledo was taken by the Romans in 193 B.C. Glass-making developed in all of these centers. In the thirteenth century Almeria became famous for its glass, while some of the output of the Barcelona and Cadalso furnaces was of an order to bear comparison with the Muranese. A century before Venetian workmen were sent to Jamestown in Virginia, Cadalso was producing enough glass to supply the Spanish kingdom. La Granja became noted for the beauty of her chandeliers, mirrors, and engraved glasses. The decline of glass-making in Spain was coincident with the exhaustion of fuel in that country. The Spaniards loved glass, and our engraved "flips" and two-handled covered sweetmeat-jars owe more to Spanish influence than is commonly supposed. We have at times overrated the influence of central European types upon our native production, neglecting the Venetian and the Spanish. South Jersey and Pennsylvania houses, in particular, copied the gimmal flask; while the mugs and covered dishes ornamented with buttons, blobs, or prunts of applied glass bear strong resemblance to motifs emanating primarily from southern Europe.

The Beginnings of Glass

In the Middle Ages, lower France and upper Italy became intermittently a territory for glass-making. The Ligurian towns, especially Altare, gravitating between rapidly changing governments, turned out a sporadic production. By 1300 an interesting primitive glass was being blown in Normandy and Poitou.

Venetian glass-production forms a link between the ancient and the modern art. The glass-workers of Venice were incorporated in 1268, and around the close of the thirteenth century the furnaces were segregated on the island of Murano, near the city, partly to keep secret the methods of manipulation and partly to avoid the danger of conflagration which existed in Venice proper. Murano thus became a notable example of localized industry. The earliest forms of manufacture were scent-bottles and decanters, while weights and measures of glass were made in 1279.

Venetian glass soon became plentiful. Its ductility, owing to its peculiar chemical composition, tended to extreme fragility, such as has characterized no other glass before or since. Exportations of glass constituted one of the chief sources of revenue to the Venetian state, the output even going to China, India, and Africa.

The most varied color combinations emerged from Murano, and the chemistry of color-compounding practised here attained the dignity of a science. The history of the Berovieros, Briati, and the revivalist Bussolin, must be read elsewhere, but the accounts of their works are as thrilling as they are educational. Briati created the glass marvel of all time—*vitro-di-trina*, a diaphanous glass lace-work never quite equaled by others. Murano glass declined with the crumbling of the Venetian Republic in 1797.

The Venetian metal, on account of the use of soda in the mix and of other peculiar ingredients, was extremely light in weight, and when in a state of partial fusion could be fashioned into the most delicate and bizarre pieces. It was pellucid, a quality attained by few of our American glassmen, though certain examples from the Stiegel furnaces possess it.

The glass-making of Bohemia, Germany, the Low Countries, France, England, and Ireland, as far as we know it, was mainly contemporary with our own efforts. A certain degree of familiarity with the production of these countries is indispensable to an understanding of the American ware. Our museums offer splendid facilities for the study of European examples, while the bibliography in the present volume lists a number of authoritative works upon the subject. These give one not only an appreciation of the output of the world at large but a fuller comprehension and a more sympathetic understanding of our native production.

CHAPTER III

PROCESSES AND TOOLS OF THE TRADE

The making of glass is an entirely different process from the making of pottery; yet the former would have been impossible, in the days of our early manufacture, without the adjunct of the clay pot and the potter. The difficulties encountered by our first glass-makers are better understood after a realization of the tedious and precarious proceedings involved in making the pots or crucibles used in melting the glass. Under modern conditions these great containers are nearly always made of metal; but until about 1864 every glass-factory required a pot-room or pot-house, whose workers played a part no less important in the industry than that of the furnace-tenders. Until early in the nineteenth century, the preliminary part of the work often began nearly two years before the finished pot was ready for the furnace.

First of all, only certain kinds of clay were suitable for pot-making. The English Stourbridge clay was long considered the best, and in the early days of our glass-making great quantities of it were shipped to America, coming as ballast on the small ocean-going vessels. It was a shale or slate clay, brown in color. Good clay for crucibles was discovered in Delaware in 1815; but from 1790 until 1860 about three fifths of the clay used by our bottle-houses came from Germany. When American clay was first introduced into the pot-rooms, it failed to give the satisfaction that might have been

expected from its chemical analysis, but this fact was due mainly to the lack of skill with which it was handled. After the discovery of Missouri clay, early in the nineteenth century, matters were greatly simplified, as this clay not only withstood a more intense heat without cracking but resisted the action of the flux better than any previously used except the German.

After the virgin clay had been selected and hauled to the pot-house, it was ground and then exposed to the elements, that it might disintegrate, ripen, or putrify, this process sometimes requiring a year's time. A cleaned and ground admixture of old broken pots, called potsherds, in a proportion of one fourth to one fifth the weight of the mass, was then added to the original clay, and the whole screened and mixed with water into a thick paste. Before a putty-like consistency could be obtained, it was necessary to trample the mixture with the bare feet—a process called "pugging." The resulting mass was then put away to "ripen" for from three to six months. At the end of this time it was plastic and tough enough for constructive use. The actual building up of the pot consumed several weeks; it was done by hand, layer upon layer, and required the utmost care, as any minute defect or tiny air-cavity would probably cause the vessel to crack in its first firing. When the pot was of the desired shape and size, it was "stored" for a final seasoning of from four months to a year, and at the end of that time it was placed first in a warm room, where any moisture was eliminated, then in the annealing-arch, where it was gradually brought to the temperature of the working-furnace. Next, it was quickly and adroitly placed in the "set," or fur-

nace proper, and its soundness was tested for the last time by throwing a lump of clay, slag, or (later) coal against the sides; unless the resulting ring was clear, the pot was destined to a short life. This "setting" of the crucible, in the face of a furious fire, was an extremely difficult and delicate task.

After all this arduous labor, the average life of the pot used in bottle-glass operations was only about seven weeks. The covered pots for flint-glass were longer-lived, sometimes attaining the hoary age of ten months. Pot-making was one of the most disheartening factors and one of the greatest problems to our early American glass-makers. The work required capital, and played no small part in the ultimate cost of production.

The furnace rooms in our early glass-factories varied in construction according to the particular kinds of glass turned out. The room for flint-glass was generally large, square, and lofty, and had an earthen floor. The furnace, occupying the center of the room, was circular or elliptical in shape, and consisted of two complete hemispheres, one inside the other, with a space between the two walls. The inner compartment contained the fire, while the space between this and the outer wall of the furnace gathered and held the smoke before it escaped from a chimney through the center of the roof. This arrangement caused an intense heat to be generated in the interior part. Furnace operations in flint-glass making generally required about three days. It was the common practice to mix the materials and feed or charge the pots in the furnace cavity on Friday morning, so that by Monday morning the "batch," in a state of molten or lava-like fusion, would be ready for the workmen. This process of "fining," or

"refining," or "hot-stoking," required at times a temperature of from about 10,000° to 12,000° Fahrenheit, sometimes more, sometimes considerably less. Imperfect cooking often resulted in tears in the glass. The shorter the time in which the process could be accomplished, the better. Coal as fuel produced quicker results than wood, and gas was quicker than coal.

Furnaces for bottle-glass were generally oblong or square, and consisted of a combustion or melting-chamber and the "cave," or ash-pit. These two parts were separated by the fire-grate or "siege"—the latter a raised bank or platform on which the crucibles were placed. The grate or fuel space was generally square, and was frequently charged from two sides. The grate was usually on a level with the floor, under which the ash-pit extended the entire length of the furnace, with ends opening outside the building, to serve as air-passages or drafts. In the sides of the furnace and directly over the crucibles were small holes, through which they could be charged. The flames in the melting-chamber played directly around the crucibles, producing an intense heat, and a period of from sixteen to thirty-six hours was required for the cooking or melting process. From white heat the batch had to be gradually reduced to red heat before it was ready for the blowers.

In a state of plasticity all glass can be blown with more or less facility. When the glass was ready the workmen took their stations, each "boss-blower" having his crucible, stage, and assistants. An assistant now took a blowpipe (a hollow tapering tube from four to seven feet long) and dipped the "nose" of it into the pot of molten glass, if necessary repeating the

operation until a sufficient quantity of the "parison," or hot glass, had accumulated on the end of the pipe. The metal so "gathered" was rolled on a cast-iron plate with a polished surface—called a "marver" or "marbre"—until it attained a regular exterior, so that the blowing might give it a uniform thickness. (In the case of window or bottle glass, this smoothing process was sometimes done on a block of wood, hollowed out and constantly wetted to prevent scorching.) The lump of glass was next expanded by blowing, and elongated by swinging.

A solid iron rod called a "pontil," "puntee," or "punty," somewhat shorter than the blowpipe, tapering and varying greatly in strength and length, was attached to the blown glass directly opposite the end of the blowpipe, a bit of sticky glass on the end of the pontil serving as cement. The "wetter-off" now detached the blowpipe by touching the neck of glass with a moistened piece of iron and tapping the glass at a point close to the blowing-iron. This fractured opening, an inch or two in diameter, was later slightly reheated, smoothed down, expanded, banded, or collared, as the requirements of the piece demanded.

The "chair-man" then took the pontil with the glass bulb attached and rolled it forward and backward on the arm of his chair with his left hand, while with a few simple tools he shaped the piece into its final form. The pontil was detached from the shaped piece by a sharp blow, which left a scar on the finished article. On the finer flint pieces this scar was sometimes obliterated by grinding or obscured with pincers. Between 1850 and 1860 an improvement called a "snap-case" was substituted for the pontil, thereby doing away with the scar and giving the piece a smooth hol-

low base. Still later, vessels were made with plain flat bottoms.

The "pucelas" were a pair of spring-tools with dull wooden blades, somewhat resembling sugar-tongs. They were fastened together with a flexible metal band or bow, and were used by the chair-man in shaping a piece of blown glass. Some spring-tools had steel blades and were used for cutting purposes. The "battledore," a small flat piece of polished iron attached to a wooden handle, was used in flattening the bottoms of tumblers and similar articles.

Scissors were used for picking up pieces of glass in the course of fashioning, and for cutting away bits of surplus metal, but it is doubtful if they were used to "shear" many of the mouths or necks of our early flasks, as Barber and others have stated. Instead, after the blowpipe had been broken off, the mouth was generally reheated, as we have seen, and then smoothed off with a small block of wood. Such pieces of wood were also used in smoothing the sides of pitchers and bowls. Pincers, marking-compasses, and measuring-sticks were some of the other tools made use of at different stages.

When the piece of glass had been fully fashioned by the chair-man, it was carried on a pronged stick to another part of the factory and placed with other pieces in an iron "leer-pan," or "lehr-pan," which in turn was generally placed on a small wagon running over tracks into an annealing-oven, or "leer." Frequently the wagon was slowly pushed through the oven and removed at the opposite end. The annealing or tempering process was an extremely delicate one, as the temperature had to be very gradually raised and as gradually lowered with the utmost precision,

in order that the molecules in the inner surface of the vessel should become inactive slowly, yet simultaneously with those of the outer surface; otherwise the glass would fly to bits at the least shock or scratch.

Glass may be decorated in many ways. It may be superimposed upon itself, and drawn out, tooled, or dragged into wave-like or curved decoration; threads plastically applied may be coiled or wound about its surface, and by means of a small pointed iron hook may be shaped into bends, loops, or zigzags; blobs, prunts, or seals of molten glass may be applied to the surface; rods of colored glass may be arranged in the body of a solid object while it is in a state of partial fusion, by what is known as the millefiori method; the surface may be flecked or spangled with gold or platinum by rolling the hot glass on metallic leaf, or made iridescent by the deposition of metallic tin. Gilding and enameling may be applied when the glass is cold, and fixed thereon by heat. Glass may also be frosted or "crackled." While it is in a state of partial fusion, a pattern may be traced upon its surface by means of various tools. Or it may be automatically impressed in the blowing or pressing processes from a design cut upon the inner surface of a mold. Glass may be etched by the application of hydrofluoric acid. Cutting and engraving are mechanical processes employed for decorative purposes by abrading the surface of the glass when it is cold. This is done with various kinds and sizes of cutting-wheels, fed with wet sand or other biting ingredients.

CHAPTER IV

MOLDS AND MOLD-MAKERS

The mold, which plays such an important part in glass-making, is not a modern or a semi-modern invention; its earliest manifestations may have been the core of sand or clay used by the Sidonians in their core-wound glass-manipulation. Many of our early native bottle-molds were made of clay, although cast-iron and brass molds were doubtless used in the first part of the eighteenth century. Occasionally steel molds were employed, and, very rarely, molds fashioned from extremely hard woods. When the mold became worn, a duplicate was made from an earthenware model which was baked from the first sharp metal master mold. Mold models of hardwood upon which the desired design was cut or applied, were used as patterns by the mold-chippers in making the master mold.

Different objects, according to their shape, required different types of full-sized section molds. The mold was generally made in one part or in two, three, or four sections. The tumbler usually required a single or one-part mold; the flask, a two-section mold; the decanter, a three-section mold; and occasional compotes, berry-bowls, punch-bowls, and pitchers, four-section molds.

The sections of the mold were held snugly together by hinges, screws, or similar devices permitting the sections to be opened by the glass-maker and the piece of molded glass removed.

The section molds always left seam marks upon the

glass, particularly when the metal was pressed mechanically into the mold or—in the case of glass blown either by the human breath or by mechanical air-pressure—when the molds were poorly constructed or had become worn. To minimize the thread or seam on the finished product, various methods were resorted to, chiefly that of "flashing" or re-firing. This flashing process consisted in giving the piece removed from the mold just enough heat, at the door of a furnace, to cause the seams to melt and disappear. Caution had to be exercised in this process. At other times, patterns to be molded upon the surface of the glass were so arranged that the seams would fall on that part of the design forming a portion of a scallop, fluting, volute, or geometrical ornamentation. This latter method was especially common in insufflated or three-section contact blown-mold glass, which was usually too thin in mixture to admit of flashing. Certain glass-manufacturers took special pains to have the mold seams as inconspicuous as possible; other houses were careless in this respect. The number of mold seams on a piece of glass gives no clue to its age; marks indicating the use of a six-part mold have been found on rare specimens of ancient glass.

When the design "chipped" or cast into the mold became indistinct or failed to form the proper relief, it showed that the mold was worn or had been subjected to too great heat, that the blowing was too lax, or that the glass had reached a state of vitrification unsuitable to proper manipulation. (This last cause was especially common in bottle-making.) The glass also had an occasional tendency to stick to the surface of the mold. To eradicate this latter evil, a system was devised whereby air was blown into the mold by the use

of a revolving fan, or tin pipes, arranged round the furnace, and furnishing a continuous stream of cooling air after each process. The process invented by Michael Sweeney for chilling the inner surface of the mold, explained in another part of this volume, eradicated much of this trouble.

In order to equalize the distribution of heat in iron molds, these were at times so constructed as to vary in thickness at different parts of the design. Plain molds were sometimes "dressed" with a slippery substance to lessen the tendency of the glass to crinkle against the smooth surface.

The structural form of the mold, in regard to its sections, has nothing to do with the manner in which glass may be forced into it, with the exception of the pattern or part-size mold, the insufflated molds, and the elaborate lateral sliding molds sometimes though rarely used in the pressing-machine. In other words, the human breath, mechanical air-pressure, or the mechanically operated plunger can force the viscous metal into the ordinary mold's interior, regardless of the sections.

While much of our finest early American glass was produced by breath and hand manipulation, with no employment whatever of a part-sized or full-sized mold, the part-sized or pattern-molds probably introduced by Stiegel were responsible for some of our most beautiful specimens. The pattern-mold which produced the "Venetian diamond" was doubtless first manipulated by one of the Manheim glass experts from Italy. The diamond pattern is found in large, small, and medium size.

The part-sized mold was made of metal, and presumably was about one third the size of the finished

piece of glass. No pattern-molds are extant in America, and their form and size have now become a matter of conjecture. Pattern-mold glass is characterized by having no mold seams. Three of our country's leading glass experts have stated to me that they did not feel able to give a definite description of the shapes of these part-sized molds, or of the exact method employed in obtaining expanded patterns. Writers who several years ago gave us detailed accounts of the Stiegel processes and of other types of expanded-mold manipulation now admit that they no longer feel certain regarding them.

We know that a small amount of glass was gathered on the end of the blowpipe, allowed partially to cool, and another light layer frequently added. This gathering of glass was then inserted into the opening of the little mold, upon whose inner surface a series of variously arranged perpendicular lines or other pattern was incised. The metal was first blown against this condensed pattern, and then contracted by an intake of the breath, permitting it to be removed from the opening of the mold. This withdrawn glass, bearing in miniature the design wanted, was then expanded by the breath until it had reached the proper size. These miniature molds may have been conical, cylindrical, spherical, or tubular in shape. Articles such as hollow perpendicularly ridged canes, and the mid-Western type of long-necked globular bottles, may have been rolled upon a ridged metal surface placed upon the arms of the chair-man's seat, the bulbous part of the bottle being expanded afterward.

In the interests of simplification, I have adopted the term "insufflated" for that kind of early glass hitherto known as "three-section contact blown-mold,"

taking for my justification one of the several meanings of "insufflate"—"to lightly blow by the human breath into a body." The process employed in giving this glass its pattern apparently defies exact description, for there seems to be an exception to nearly every rule concerning it. The old designation is particularly misleading in that (1) glass of this kind has been found with marks indicating the use of a mold in *four* sections; (2) all glass blown or forced into a mold must necessarily come into contact with the mold; and (3) other glass than that of this particular type is blown by the human breath into a mold.

The following points may be noted in connection with this glass: (1) The molds used in its making were always full-sized; (2) the patterns are, almost without exception, distinctive to this type of glass; (3) mold marks are visible upon its surface to the naked eye, unless the piece has been carefully "flashed"; (4) an iridescence seldom found in other American glass was given to much of this glass, owing to its extreme thinness and the method of its manipulation.

Great benefits will be rendered the glass-collecting world when a monograph on this subject, now being prepared by Helen A. McKearin, comes from the press. It will illustrate and catalogue the various patterns and their subdivisions in a manner which will enable the collector to identify and designate the glass by such patterns. This author has catalogued more than one hundred varieties of the geometrical type and more than a dozen of the Gothic or arched. I have taken the following extracts from her article on "Three Mold Glass" published in the August, 1924, issue of "Antiques":

The "gathering" of liquid glass on the blow pipe was blown into the mold on the inside of which the pattern was cut intaglio. In the blowing, the air forced the plastic glass into the form of the pattern in such a way that the finished piece, when taken from the mold, showed a depression on the inside to correspond to each protuberance on the outside. The patterns of some pieces which I have found indicate that the design, instead of being cut entirely intaglio in the mold, was partially in bas-relief, which, of course, produced a fluting, or concavity, on the outer surface of the piece blown in the mold.[1]

Typical three-mold patterns may be classified under three heads, more or less arbitrarily chosen to aid in classification: namely, *geometric*, *arched*, and *baroque*.

Under the first head, *geometric*, the patterns are made up of one or more bands of decoration composed of one motif or a combination of motifs. There are five principal motifs used: (1) *Ribbing*, which may be vertical, horizontal, diagonal, twisted, or herringbone; (2) *Fluting;* (3) *Diamond Diapering*, an all-over pattern of diamond-shaped protuberances; (4) *Sunbursts*, a square or rectangular frame with radii from a center to the sides; (5) *Diamond-in-the-Square*, square or rectangular frame enclosing a diamond usually equilateral. In the sunburst and in the diamond-in-the-square there are variations as to centers and corners. . . . A band of diamond diapering between bands of vertical ribbing is, perhaps, the most common of all and explains the mistaken conception of three mold as three bands of decoration . . . there is no standard width for the bands of the pattern. . . .

The use of the sunburst motif . . . to form medallions in a band of diamond diapering is the one we most often encounter. In a few patterns we find another use . . . that is, to form a band entirely of sunbursts. . . .

[1] When an object with circular cross-sections, like most of the insufflated glass specimens, was blown into a mold on which an ornamental design was deeply cut, the mold (which of course was full-sized) had to be of three or more sections. It is believed that insufflated plates were blown against or into a circular, disk-shaped, three-section mold.

The second and third groups—those which fall under the divisions arched and baroque—are each smaller than the geometric. The patterns of the type called arched are so denominated because they are characterized by an arched motif, usually either Gothic or Roman. . . .

The baroque group is sister to the arched. The term "baroque" has been chosen to signify that group of patterns which, in general, resemble the type of architectural decoration known as baroque or rococo. When used in reference to ornamentation, it calls to mind that Italian style composed of conspicuous curves, volutes, and scrolls; in short, it is a highly ornate decoration. . . .

There are a few pressed three mold articles, such as decanters and cruet sets, which have a concave surface to correspond to convex and which have been molded into patterns similar enough to blown baroque to be mistaken for it unless one is very familiar with the two kinds of glass. In these places, however, the quality of the glass is so patently inferior that the resemblance goes no farther than the type of mold and the pattern. The blown articles have a living, liquid brilliance, but the pressed ones are like dead cut glass. Above all things, the fact which must always be kept in mind, and which cannot be over-emphasized, is that these patterns with which we have been dealing occur in the *blown*, contact, three mold glass, *not in the pressed*. The essential differences arise from the method of production.

While many of the seventeenth and eighteenth century glass-houses employed exclusive mold-makers, nevertheless from 1825 to 1870 it was not exceptional for manufacturers to purchase molds from a general supply house or to have their molds "chipped" by a migratory professional during his few weeks' or months' sojourn at this or that factory. It is unsafe to attribute a piece of molded glass to a particular house on the basis of design, and at times it is quite

futile, for the same mold patterns are known to have been made at four or five widely separated glass-houses.

Philadelphia and Baltimore mold-makers emigrated over the National Road after 1825, bringing the Eastern patterns and dies to the trans-Alleghany houses; at times duplicating, again slightly varying, the designs. Molds were occasionally exchanged between houses in the same locality, such as the Stoddard and Keene works in New Hampshire, and the Westford and Willington houses in Connecticut.

To add to the confusion and our confounding, if a new design launched by a bottle-house or a pressed-glass house caught the public fancy, it was immediately copied by a half-dozen die and mold makers, as instanced in the "Jenny Lind" and "Pike's Peak" bottles, or the "Henry Clay" and "Log Cabin" cup-plates.

Boston, Philadelphia, and Pittsburgh were centers of mold designing and making. During the height of her bottle-glass and pressed table-glass supremacy, Pittsburgh boasted of no less than five independent mold-making establishments, although the larger firms, such as Bakewell's and Lyon, employed their own artisans. The Novelty Glass Mold Works of Martin's Ferry supplied adjacent territory in the mid-nineteenth century.

Little is known regarding the individual mold-makers. Philip Doflein has been brought to our attention by the late Dr. Edwin AtLee Barber. An artisan who learned his trade in Germany, Doflein became one of our best designers and chippers, executing many excellent models for the trade, especially for the Kensington industry. He furnished molds for many scent, perfume, and toilet bottles, and it is believed that he originated the calabash form of bottle. He was the

last of the old-time cutters who prepared historical designs for our flasks, and was probably responsible for the Philadelphia types of the Washington, Jefferson, Jackson, Taylor, and other busts, and for that of Louis Kossuth, the Hungarian patriot. Careful and conscientious, this interesting man made molds in America from the forties to about 1890.

Stacy Williams, George H. Myers, and George Koechlein were responsible for many of "Dr." Dyott's celebrated restorative, beautifier, and proprietary containers. Edwin Fayle also made molds in Philadelphia. J. C. Schaffer and A. M. Badger are listed in Rochester, New York, directories; Roger Williams and James Fitsmorris were employed by Bakewell, Page & Bakewell; Ralph Galagher worked for Lorenz and Wightman; Hiram Dillaway was the leading mold-maker at the Boston and Sandwich plant for a number of years. We do not know his name, but the mold-maker for the Louisville Glass Works designed the "Eagle, reverse Eagle" type of flask made in the sixties by this factory and by Cunningham & Co., Berry & Co., William Frank & Son, and William McCully, all of Pittsburgh.

Although Washington Beck was a well-known mold-maker of his day, little if anything concerning him has appeared in print since glass-collecting in our country became both a pastime and a passion. Started in a very small way in Pittsburgh in 1857 or 1858, Beck's business expanded so rapidly as soon to require a large two-storied building. In addition to supplying a large part of the trade in western Pennsylvania, and many other American manufacturers, he shipped his production to all parts of the world where glass was made, his molds and presses being used extensively

in France, England, Belgium, Germany, Austria, the Scandinavian countries, and even Japan. It is quite possible that some of the many reproductions of the nineteenth-century glass now being imported from several of these countries are "revivals" from the molds shipped abroad by Beck nearly seventy-five years ago. Is it any wonder that last year's Belgian, German, or Japanese pressed-glass importations are at times difficult to distinguish from some of our well-preserved ware of the sixties?

"Wash" Beck, as his familiars called him, was born in Pittsburgh in 1839. He belonged to the "glass crowd" of that place, during the days when Pittsburgh was providing the tableware for half of the country's homes, and furnishing the glassware for two thirds of her bars, on both land and water. He was awarded nine patents in the general field of his work, a record which justly entitles him to a niche in the hall of fame of the glass world of our country, along with such men as Robinson, Jarves, Gillerland, Lyon, Hobbs, Leighton, and Owens. His skill and talents seem to have been more generally appreciated abroad than at home, and it is said that he was one of the only two foreigners ever invited or permitted to go through one of the leading French glass-factories, the Crown-Prince of Prussia being the other. Beck's slogan was: "A constant succession of new designs."

In the year 1860, the combined capital of the five metal-mold works in Pittsburgh alone was $285,000, the value of their raw material $105,211, and they employed three hundred and thirty-four male workers. The figures are astounding, affording a conception of the magnitude of our glass-making after the use of pressed glass became general.

CHAPTER V

ATTRIBUTION AND AUTHENTICATION

One of our most authoritative students of early American glass, Mr. George S. McKearin, writing on "Wistarberg and South Jersey Glass" in the October, 1926, issue of "Antiques," emphasizes the following statement:

> Let me make clear at the outset—*when I speak of early American glass I refer to type, pattern, decorative technique, and quality of glass, rather than to date.* The collector of Americana does not think of the period from 1825 to 1860 as *early*, and chronologically it is not; but, in the field of American glass, many of the finest specimens, bearing every apparent indication of eighteenth century production, were blown in relatively obscure factories scattered throughout the New England states, New York, Pennsylvania, New Jersey, Ohio, Maryland, and that part of what was then Virginia but is now West Virginia, during the early and mid-nineteenth century period.
>
> In the choicest collections, those privately owned and those in our museums, many of the best specimens of early American glass, referred to as *Stiegel* or *Wistarberg*, were actually produced during that much later period. Nor does this fact detract one jot or tittle from their interest or their beauty in form, color, and design; neither does it lessen their rarity.

The late Mr. J. B. Kerfoot, author and collector, has written as follows:

As a matter of fact, practically all the pieces now collected as *Wistarberg* or *South Jersey* glass are of this later origin, the commercial output of all these factories having consisted of window-glass, bottles, snuff canisters, and other similar hollow-ware. Again and again, as a matter of proved and indisputable fact, three generations of these workmen continued for more than one hundred years to make for themselves and their friends the same range of pieces, unaltered in form and indistinguishable in technique. So that, so far as concerns these wholly true-to-tradition specimens, the attempted differentiation between true *Wistarberg* pieces and *South Jersey* pieces is utterly futile and meaningless. But, call them what we will and date them as we choose, their rarity remains the same.

Mr. Stephen Van Rensselaer tells us:

Even superficial study must convince us that there were early American glass factories operating later than Stiegel in which Stiegel technique, color, and other characteristics were copied and perpetuated. Many of the bottles found in Ohio, which have hitherto been attributed to Stiegel, were copied by workmen formerly employed by him.

Mr. Arthur Sussel, who for many years has been associated with our early glass, remarked to me a few months ago:

"Emphasize the fact that it is not the year in which a piece of glass was made, not the State in which it was made or is found, which determines either its desirability esthetically, or its monetary value. Form, color, decoration, and technique must combine to form the true criterion of worthy early American glass, whether it was made in 1760 or 1860."

The opinion of these authorities as expressed above

is upheld by such well-known dealers in early American glass as Mrs. Francis Nichols and Mr. Israel Sack of Boston, Mr. Renwick Hurry, Mr. Henry V. Weil, and Mr. Charles Morson of New York. It is upheld by the editors of our magazines dealing exclusively with antiques, and by the curators or assistant curators of our most progressive museums and historical societies. I heartily agree with all of these statements.

Summing up the matter, it should be said that one can seldom "date" a piece of early American glass by form, design, color, or technique. Yet the assurance that one's blown specimens were produced between the years 1760 and 1860 may be confidently felt by every collector (with the rarest of exceptions). Lacy pressed glass was in the main produced from 1837 to 1864.

Until recently the general collecting public did not realize that America has had so many glass-factories, both large and small. Well do I remember the day, not long gone by, when we blithely yet ignorantly labeled every blown example either "Stiegel" or "Wistar." It is now acknowledged that many of these pieces are only a century old, or less. Our glass may be Boston or New Boston; Albany or New Albany; Milford, Medford, or Millville; Brownsville or Greensboro; Keene, Pitkin, or Wellsburg. It matters not, provided it is meritorious.

Certain glass-houses *did* produce individual forms or designs; certain houses originated designs which were later copied by other factories; certain houses brought workmen to America from European glass centers who have given us examples of a distinctive technique. But in the main, one cannot say that this or that house

made any given piece of glass. When it comes to pressed-glass patterns of the 1837-64 period, one should almost never be arbitrary, either in the matter of date or in that of factory attribution. One may know when the pattern originated, but still be unable authoritatively to state whether a given piece was made in the year the pattern was first designed or thirty years later.

I do not wish to appear the complete iconoclast, but it is essential to destroy certain popular notions in respect to early American glass, in order that the ground may be cleared for future building. Let us now consider the "five old reliables"—the common tests, hitherto generally accepted, for dating and identifying old glass:

First, the pontil mark. Glass can seldom be dated or attributed by its pontil mark. Until reproductions or spurious ware began to creep into the market, this was a fairly safe method for differentiating old glass from modern. Nowadays, blown glass made last month in Belgium, Czechoslovakia, Japan, Indiana, New Jersey, or elsewhere frequently bears a pontil mark. It is said that certain of our early houses used a uniformly large or small pontil (which may be true); that certain houses attempted to obscure the rough pontil mark by grinding or rubbing down, or by various methods of "pinching in" about the base (which is true); but we have no way of knowing how many or what factories used these distinguishing marks and methods. Glass-blowers were itinerant and migratory; they carried their rods with them. Again, many glass-works did not use a uniform-sized pontil, but manipulated various kinds of pieces with rods of different sizes and lengths. The age of an old flask may be roughly determined as before or after the invention,

sometime between 1850 and 1860,[1] of the snap-case which took the place of the pontil-rod; but general identification by this method is precarious.

Secondly, the "ring." Resonance of glass, one of its attractions and delights, is a proof neither of age nor of maker. Present-day glass industries, such as the Steuben of Corning, the Heisey, and the Cambridge plants, are making glass with as fine a ring or tonal quality as one could wish. Certain old glass has a vibrant, full, sonorous tone when struck; other glass of like age, just as valuable or desirable, may give forth almost no resonance. The blown flint of Stiegel rings delightfully; so does some of the pressed ware of the New England Glass Co. and of Beatty & Stillman, made by an entirely different method at a much later date. No glass-works held a monopoly on resonance. One fact, however, is to be noted; after the substitution of soda-lime flint for lead flint in 1864, the glassware made from the former possessed little resonant quality. Pressed glass which sounds "dead" when struck can almost always be considered "modern," i.e. produced after 1864.

Thirdly, signs of wear. Old glass which has had general or constant use will evidence unmistakable signs of wear. A portion of our early glass has, however, seen little use, especially the glass which has migrated, and has been kept safely upon the top shelf of the cupboard for years—perhaps for more than a century—as a cherished memento of early days in Eastern colonies or States. Glass made in 1910 may be more worn than that made in 1810. Modern glass can easily be "faked" to look scarred, scratched, or badly rubbed by use.

[1] Van Rensselaer places the date at 1856.

Fourthly, family history. In the case of glass made during the nineteenth century, family tradition may be reliable. When a piece has come from a home in the vicinity of a glass-works, and in particular when a former member of the family was employed in this factory, one can invariably trust such attribution and authentication. But otherwise, in this as in other antiquarian matters, it is far from safe to rely too implicitly upon what our parents or grandparents may have told us—or what we think they have told us.

Fifthly, the "touch." There are those who assure us they can tell old glass with their eyes shut. None of my collector, dealer, or curator friends claim the possession of this magic touch to any marked degree. Old blown glass is usually of uneven surface; its base is not true; its sides are not uniform. Touch will reveal that it is blown and hand-manipulated. Old pressed glass is nearly always uneven on its smooth surface, and touch will reveal this fact. Yet the sense of touch will in no way help us in dating or attributing a piece. I have seen such grave mistakes made by those who rely upon this sense that I would advise the amateur not to attempt to cultivate it.

One cannot hope to learn all there is to know about old glass while casually inspecting a few shop windows, glancing at a museum collection, or motoring on an August day through New England. Complete knowledge, indeed, can never be attained; while long association and study are essential to even an intelligent comprehension of the subject. A few general hints and suggestions may, however, prove of help to the novice in glass-collecting.

Old glass is seldom "true to form." It usually has a brilliant and vibrant appearance, while the spurious

article looks dull and lifeless. Old cut glass possesses a refractory power which the reproduction or imitation frequently lacks. Nearly all old glass contains some flaw or irregularity. This enhances, rather than detracts from, its desirability. But it is important to note that by flaws I do not mean "time-checks," chips, or cracks. Even the small collector will do well to avoid damaged pieces, unless these are exceedingly fine or rare. Few cracked bottles are worth keeping, unless of unusual color or great rarity. On the other hand, a slight nick in the serration of a cup-plate's edge or in the bottom of a salt-cup does not detract greatly from its value. When a piece of glass turns up which has been hitherto unknown, it should be salvaged even if badly damaged. Old glass was never put on the buffer's wheel. The foot of an old blown piece is never quite flat. Old clear glass never has a cold or chilly look. The action of sunlight has taken away this appearance. As furniture acquires the patina of age, linen becomes time-stained, and metal becomes tarnished, so old glass takes on a certain mellowness which gives it charm.

Conventional, pictorial, and historical flasks can be "dated" in the majority of instances. One must, however, be familiar with the evolution of the nineteenth-century bottle, and with the events in our history which frequently are commemorated thereon.

Interest in glass-collecting increases as one becomes more familiar with the political, economical, racial, topographical, and geographical history of America.

PART II

The Earliest Beginnings in America
1609 to 1737

CHAPTER VI

IN THE DAYS OF OUR YOUTH

In order to understand why the era in our history between the years 1609 and 1737 was not conducive to the making of fine glass, it is best to review a few facts relating to the customs and requirements of this time in England and in our provinces. At the beginning of the exodus from the Old World to the New, the mother-lands had scarcely begun to acquire what may be called a glass consciousness; glass as a necessity was scarcely known in the more remote parts of England or the Low Countries. Although Sir Robert Mansell imported fine Venetian drinking-glasses for the aristocracy and nobility of England, the gentry and the peasantry knew next to nothing concerning glass as a household utility.

The bottle, the first article made by glass-furnaces in nearly every land, was uncommon in England until the time of Charles I. Wine was matured in the wood and drawn from the cask into wooden, pewter, or pottery containers, for immediate consumption. It was never stored in glass bottles, as it is to-day. In fact, the sale of glass-bottled wine was prohibited in England in 1636, as a result of the dual difficulty in obtaining an adequate supply of bottles and in making these extremely crude containers conform to proper measure.

The evolution of the bottle can be traced step by step in the chronologically arranged collection on dis-

play in the Guildhall Museum of London. This exhibition shows a gradual transition from England's first primitive types to the present-day forms. It affords an educational study in the qualities of the metal as well, and the idea is worthy of emulation by our American museums.

Contemporary with our earliest colonizations, the niceties of eating and drinking, as we know them today, were seldom employed. Pewter and wooden trenchers, of a size capable of holding the entire meal for a large family, were placed in the middle of the trestle or stretcher tables, the human hand being the most common carrier of food from the eight-inch pewter plates to the mouth. That instrument called the fork was almost unknown. Jovial groups gathered round a flagon, in ignorance of germs, and men and women consumed food and drink in a way which would shock our modern sensibilities. For many a year little or no glass graced our ancestral court cupboards.

Those intrepid early voyagers to our bleak northern coast, who in England had been somewhat familiar with the fanciful fragility of Venetian glass, found it quite inexpedient, even impossible, to trust anything so delicate to the crowded and cramped quarters of the little vessels in which they came. On shipboard, and later upon American soil, exposure, improper nourishment, and contagious diseases ravaged and wrecked great numbers of the colonists. Almost half their number were lowered into the sea or buried in shallow graves along the coast. It was a tragic affair, this epochal settling of New England; and the survivors, thankful merely to be alive, gave little thought to the externals; food for the internal and the eternal were their two main objectives.

Stout hearts had they, and strong utensils. The beauty of Italian glass was left behind with the frill, the feather, and the furbelows of court. The wigwam, the cave, the sod hut, the branch-and-slab or the early clapboard structure required durable and simple equipment. And although our artists of twenty-five and fifty years ago picturized our Puritan "landings" and Quaker "meetings" in an engaging manner, I have always been a bit skeptical regarding even the ideal condition of the bonnets, caps, and aprons of their maidens. Alas, there was no starch for fair Priscilla's linen in 1621!

Men were born and lived and died within the confines of what are now the States of Maine, Vermont, Virginia, and the Carolinas who had seldom, if ever, seen the substance called glass, and had never themselves used it. Our migratory Americans concerned themselves with the gunsmith, the pewterer, the potter, the trapper, the tanner, the version or interpretation of the Scriptures, but not to any extent with glass-making; the blower of glass bubbles was not even of secondary consideration in their lives. In the seventeenth century there was almost no demand for glass, and consequently little of it was made. What is one century's necessity is another's luxury, and yet another's unknown quantity. We of to-day would find it impossible to exclude glass from our daily life.

In the strange assortment of documents and records relating to life in our provinces during the seventeenth century, reference is seldom made to glass. Prior to 1730 it was rarely bequeathed in wills. A certain Newbury (Massachusetts) widow left "a glass bowl, beaker and jug valued at three shillings," but such an incident is exceptional.

Glass window-panes were probably first brought over from England in 1629 or 1630. The famous Rev. Mr. Higginson of Salem wrote "home" in 1629 advising all new-comers to bring their panes with them as a substitute for the oiled paper then commonly used. In many localities in both Old and New England, documentary evidence proves that, as late as 1700, window-glass was difficult to obtain. In the homes of the well-to-do, from about 1640 to 1650, two fairly ample windows were built into each story of the clapboard structure, and heavy, greenish, rhombic glass set into the leaden frames. (Hand-wrought hinges and iron nails also were exceedingly scarce.) In the homes of the poorer folk the windows usually opened casement-wise, the panes being diamond-shaped, the windows themselves measuring but two and a half to three feet in length and one and a half to two feet in width. It is stated on good authority that in certain sections of Maine as late as 1745 there was not a house with a pane of glass in it.

The use of the lamp antedates the use of the candlestick in our country. Until 1630 there was no tallow from which to make candles. Bear's-grease, used in the first crude open types of "betty lamp" which hung by a chain and a sharp prong from a clink between the logs or slabs of the wall or from the high-backed seat, was smelly and smoky. The discovery of oil in the sperm-whale provided a better illuminant. It also created a demand for a few crude glass lamps from New England's first glass-works. The advent of the cow into Boston, around 1630, created a demand for the glass milk-pan. There are no extant records in support of my opinion, but I believe that, with the possible exception of the two Jamestown glass-houses,

every early colonial glass-industry turned out pans or bowls for milk and cream. The sperm-whale and the cow have been too long pushed into the background by the Sacred Cod.

The planting of vineyards and fields of corn also stimulated the use of glass. In 1620 the London Company ordered a vineyard set out near Charles City. In 1648, Robert Evelyn, who had "resided several years" in the provinces, wrote a letter which may be found in Plantagenet's "Description of New Albion" (the present State of Delaware). It describes a fertile valley, poetically called "Uvedall," where grape-vines ran up the mulberry and sassafras trees and bore four varieties of grape—"the Thoulouse Muscat, the great Foxe, the red Xerxes, and a White variety."

The first permanent Swedish settlement in Delaware brewed tea from sassafras bark, beer and brandy from persimmons, and "small beer" from Indian corn. As early as 1662 the little city of New Amsterdam had several flourishing breweries. Our New England forefathers also brought the drinking customs of Old England with them. In my opinion, several early glass-furnaces, about which we know absolutely nothing, made glass roundels or "bull's-eyes," glass panes, and crude bottles for our early settlements.

The bottle is given more or less prominence in this volume because, until at least 1860, it was the leading article of our glass-manufacture, and it probably held a preëminent place in the output of the industry until as late as 1870. Every type, every texture, and every method employed by our early American glass-makers is found embodied in our bottles. The size of the containers for spirits which stood upon the shelves of the "ordinary," or inn, was prescribed by law. "Rest

and refreshment" for the traveler were compulsory, and in some of the provinces liquor could not be retailed in less than two-gallon containers, later reduced to one-gallon. This necessitated junk bottles, demijohns, and carboys, especially if the restless seeker of fortune wished to take his liquid refreshment with him. Rum became an almost indispensable cargo in the days when men fought swamps, wilderness, waters, insects, and wild animals, and were constantly exposed to the elements. The captains and crews of our ships turned to rum to sustain them on long voyages.

The eastern coast of America became settled by groups of people who held to widely differing standards of living, manners, dress, morals, religion, and even punishments. Many of the poorer folk lacked almost every creature comfort, including sufficient clothing and bedding and proper medical care. Many men, alone in the world, took to the vast stretches of forest and became backwoodsmen, life for them becoming primitive. Everybody drank some sort of concoction. Mysterious potions were brewed for the ailing, elixirs-of-life and love-potions were secretly peddled, and the bottle gradually came into great demand.

Paradoxically, the seventeenth century was an age of physical exhaustion and of restraint, bringing about an emotional eclipse; and repression never begets a florescence in any of the arts, and seldom in the crafts. We were not ready for our Bampers and our Stiegels, with their organs, their chamber-music, their trappings of state, and their musical glass-blowers. Neither were we prepared for the beauty and delicacy of amethystine salts, or fragile latticed sugar-bowls glowing with the color of Catanian amber.

All in all, the days of our early colonial youth were almost devoid of glass as we know it to-day. But let us read the little we have been able to gather concerning their glass-making efforts.

CHAPTER VII

THE FIRST JAMESTOWN VENTURE

Captain John Smith wrote a book setting forth, in the most glowing terms, the advantages of colonization in the New World. Their imaginations afire, a group of young Englishmen organized "The London Company" for the main purpose of promoting a colonizing venture to this mysterious land of great promise. The founders of the company, named in the Charter of Virginia, were Sir Thomas Gates, Sir George Somers, Richard Hakluyt, and Edward Maria Wingfield. In 1606 three small ships set sail from England in command of the redoubtable Captain Christopher Newport, who had won his laurels in successful expeditions against the Spaniards.

This rather unusual undertaking was called "the adventure of the purse"—a frank avowal of the real object of the expedition. It took four months for the little vessels to reach America by way of the West Indies, but the hopes of new riches and rewards kept the group of gay and blithe soldiers of fortune from forebodings.

The fleet sailed into Chesapeake Bay and dropped anchor at Point Comfort, their charter calling for a tract of land between 34 and 38 degrees north latitude, between what is now Cape Fear and the Potomac River, in North Carolina and Virginia.

Besides the crew there were one hundred and five persons on board these three ships, forty-eight of

whom were "gentlemen" who held all personal manual labor to be disgraceful. For necessity's sake they brought twelve laborers, four carpenters, and a few mechanics with them. The rest were soldiers and servants. After three weeks of indecision, a suitable site was selected for the fort and settlement, on the northern bank of a river which they named the "King's" or "James," in honor of the reigning English monarch, James I. This spot was about fifty miles from the mouth of Chesapeake Bay, and they called it "James Towne."

Although belonging to the aristocracy, these English gentlemen were not accustomed to the common use of glass. The London Company, however, was aware that glass-making had a future, though conditions in England tended toward the curtailment of its manufacture. The fuel problem was paramount—for this was before Sir Robert Mansell had received his grant by which sea-coal could be used instead of timber in the furnaces. According to Captain Smith, this new land possessed unlimited tracts of virgin timber and the best of sea and river sand for silica. Also, it was argued, a glass-industry would not only help the precarious situation in England but give employment to many persons who might wish to emigrate to America; and, indirectly, would clear the land for habitation and cultivation. The scheme sounded plausible.

Upon arrival, the little group of adventurers, basking in the imaginary rays of the gold which they thought would enrich them with hardly more than a turn of the hand, refused to spend their energy even so far as to keep body and soul together. Plume, sword, and lace had they, buskin and jeweled ring,—a veritable glory for this land of promise,—but the deep-

est despair ever recorded in the pages of our history was to be theirs.

The drinking-water of the river was impure, and the settlers failed to drill wells. The barley and wheat had become musty and moldy in the ship's hold; an almost exclusive diet of crab and sturgeon increased the rapidly spreading sickness. Antagonisms with the Indians, homesickness, false pride, and helplessness wrought fearful havoc in three months' time. Melancholy stalked abroad with Death. At the end of two months the colony was reduced to thirty-nine weakened and broken men.

In the autumn of 1608, a second company sailed from England, including in its roster four bankrupt London jewelers, goldsmiths and refiners, a little group of eight Dutch and Polish glass-blowers, and workers to "teach the art of making pitch, tar, potashes and glass." The passenger list of seventy included two women.

The survivors of the first venture had rebuilt their flimsy slab houses, which had been destroyed by fire. Everything was again in readiness to mine or gather and refine the "gold," the main objective of the colonization. But the glittering substance along the shores of the river and in the soil proved to be nothing more than yellowish mica!

A glass-house had been erected in the meantime on a piece of cleared ground about a half-mile from the settlement, the idea of building it at this distance being to minimize the danger from fire. The works was operating "with alacrity and success" by the spring of 1609, and although notations regarding the output are extremely fragmentary we know that returning ships carried back to England, along with "clapboards,

fur and hides, some cedar, tar, pitch and potashes," examples of our earliest manufactured product, glass.

But the great weakness of this second settlement was the same that had in part wrecked the earlier undertaking—a preponderance of non-working "gentlemen." John Smith, in desperation, prayed for more laborers and less of the leisure class, but the former failed to come.

Here was an overflowing abundance of timber and sand, and here were eight experienced artisans, but no one could be persuaded to fell trees or dig sand. In a few short months the glass-making had reached a stage of stagnation. Matters in general soon came to a dire pass. By the winter of 1610 the "gentlemen" had consumed the stores, killed all the live stock, traded their muskets and munitions to the Indians for food, and then starved. It was one of the world's most curious manifestations of the I-won't-work idea. And it ended in defeat. Certainly this was no place for a glass-house!

In John Smith's "Historie of Virginia," published in 1632, a copy of which is in the library of Harvard University, we read: "We sent home ample proofs of pitch, tar, glass, etc. (Pounds) 100 a ton in Denmark." And again: "All this time the Dutchmen remained with Powhattan, and their comforts not following as they had expected, they sent Francis, their companion, to the glass house, a place in the woods, near as may be to James Towne, where was the rendezvous for all the suspected villany." Had the abandoned works become the scene of plot and counterplot? There are certain mysteries connected with the colonization of Virginia which will forever remain unsolved, and the glass-houses are among them. When

Captain Argall arrived in 1617, he found what was left of the factory "in decay."

We can only speculate upon the production of this furnace. Did it make heavy, squatty bottles? Crude bubbly bowls and pitchers? Coarse greenish pans?—or possibly lamps? Of the cargo sent to London we know nothing. A specimen from it, unrecognized, may be gracing some English collection to-day. Were authentication possible, an example would be almost priceless. This little short-lived industry will interest us for all time. It has been rumored that the Spaniards, during their occupation of the Pueblo district, operated a glass-works, but that its output was for local consumption only. The Dutch-Polish-English-American glass-plant at James Towne, established primarily for export trade, thus produced our first made-in-America article to sail the sea in ships—the forerunner of great cargoes.

CHAPTER VIII

THE SECOND JAMESTOWN VENTURE

Flint-glass had not had its birth in England when another large idea seized upon the London Company, the promoter of things in general in the Virginia territory.

By sad experience the members of the organization had found that the Indian considered himself the owner of the land, and that without his help they could not secure game, corn, and other food, furs or peltry. The marvelous efficacy of imitation jewels in obtaining what was wanted from the aborigine had somehow been discovered, and the London Company correctly reasoned that a string of almost worthless glass beads would work wonders in barter and trade with the rightful owners of America. The red man, with his innate love of color and ornament, had fallen an easy victim to the baubles which had previously been offered to him. Thus did the idea of a "glass-mint" germinate and reach fruition in the minds of those who made up the London Company.

They decided it would be necessary to curtail production, and never allow the beads to become common from oversupply. The beads should not be "vilified" —made ordinary, worthless. And this astounding scheme came into being as a part of three "Rolls" promoted by the company. These Rolls were lottery-like, get-rich-quick ideas, with no "blue sky laws" to hamper operations. Any one "with the price" could

subscribe to them, and our modern manipulators of precarious promotions fade into insignificance by comparison.

The first "Roll" was that for the "Maids"; the second, for the "Guest House"; the third for the "Glass House." It is scarcely necessary to state that the first was the most popular. Every man in the wilderness of Virginia was desirous of a buxom English girl for a wife, and the price per capita rapidly rose from £120 to £150. No laws like those of the twentieth century interfered with the plan, and the maids themselves were most willing to go over the high seas and enter into unions with these unseen gentlemen and laborers. They arrived, and the subscribers obtained payment in tobacco, which John Rolfe had begun to cultivate in 1619 (the previous year). The girls were advertised as "pure and uncorrupt," and jewels many of them proved to be, worth far more than their purchase price of from one to two hundred pounds of tobacco. Death soon claimed many of these young women. It was a queer passenger list, composed of the maids, leaving home forever for an unknown destiny, a little company of six Venetian glass-blowers, probably smuggled out of Italy, and a few adventurers and servants!

Conditions roundabout James Towne, Henrico, and Charles City improved in 1620 (I think the advent of the girls had something to do with it), and other ships brought additional settlers, attracted by the tales of wealth to be gained from the cultivation of tobacco. A Dutch trading vessel, trafficking in slaves, brought twenty negroes to the shores. They were eagerly seized upon to solve, in part, the question of labor in the tobacco fields. This was the beginning of slavery in America.

New attempts were now made to produce "pitch, tar, soap, perlashes," and an iron-works was built. The cultivation of the mulberry tree for silkworm culture was advocated. Indian corn was planted, and vines for wine; flaxseed was distributed; the breeding of cattle was urged by the London Company. The glass-house got under way, and the Indians were beginning to trade great tracts of land for the round and cylindrical little beads.

It is probable that the glass-house and the iron-works, each some distance from the fort, were adjacent. The subscribers to the Glass House Roll were to share in the profits of the glass sold on this side of the water, in skins and fur traded for it to the Indians, and in the sale of the bottles and table-glass which was supposed to have been sent to England.

In the "History of the Virginia Colony of London" we find a letter from the London Company to the James Towne authorities dated July 25, 1621:

> We commend unto you Captain William Norton who is now sent out by the general company and many private adventurers for the erection of a glass-works. We desire he may be planted with his gange in the guest house that Lieutenant Whitaker has erected for us, there to reside till he hath found a convenient place to erect his furnace, in the choice thereof we desire you to give him your best assistance, and especially have a care to seat him near some well inhabited place, that neither his gange be surprised [by Indian attacks] nor the commodities of glass beads be vilified by too common sale to the Indians.

About a month later the company wrote:

> In the next place we commend unto your care Captain Norton and six Italians, together with the rest of his company,

to which we pray you to be helpful at his landing, to carry his people and goods to the guest-house of Lieut. Whitaker. It is the only body in this ship that the general company hath interest in and therefore we all expect the best help and advice, especially in making choice of a healthy place to plant himself in, near to the best inhabited town, either in Charles City or Henrico, but by no means lower than James City nor remote from people, and in case Captain Norton shall die, we pray your Mr. George Sandy to undertake the oversight of the work, and if he should fail by any misaccident, which God forbid, we entreat you, Mr. General Thorpe and Mr. Jo. Pointts, to take it into your care, and in your absence to appoint some trusty person to ouste this business, for which the general company and private adventurers will be very thankful to you. The making of beads is one of Captain Norton's chief employments, which being the money you trade with the natives, we would by no means have, through too much abundance, vilified, or the Virginians at all permitted to see or understand the manufacture of them. We pray you therefore seriously to consider what proportion of beads can be vented and their worth not abated, and intimate the proportion to Captain Norton and his Italians, and certify the same to us in your next letter, that accordingly we may limit the quantity that shall from time to time be made.

Another extract from the correspondence of that day reads:

Next the Publique we must again recommend unto you last year's undertaking of the glass works. The fur, the maids, and the magazines that each have missed of the present return which they expected, yet in the end the good procured of their adventure may enable and encourage them to go on in these and the like necessary kinds of supplies which have here arisen.

Three of the Italians we know by name—Bernardo, Boniventuro, and Vincenzo. It is evident that from the

start there was friction between them and the "overseers." They quarreled and fought, especially with George Sandys, who replaced Captain Norton after the latter's death. Sandys, a man of culture, who has given us the first English translation of Ovid, exclaimed in his disgust and wrath, "A more damned crew hell never vomited!" The work of making beads with which to cheat the Indians was more difficult for this man than a Greek translation.

Historians differ concerning the ending of this venture. Some of them state that the glass-mint and the iron-works were destroyed simultaneously during the great massacre which was begun on March 22, 1622. Three hundred and fifty persons perished in the first surprise attack. Powhatan had been called to his fathers. Chief Opechancanough was on the war-path. Little was left of the colony by the time hostilities ceased. Other records say that the glass-house survived the attacks (or was purposely spared, the red men being loath to destroy the queer place that made their colored beads); that in 1624 there were five men working in the glass-house, and that "they longed to return to their native Italy."

One chronicle states that in 1624, matters becoming worse and worse between Sandys and his "gange," one of the Italians suddenly seized a great crowbar and in an infuriated state smashed the furnace and the glass "into a thousand slivering pieces." Thus the exclusive right for making glass for seven years came to an abrupt end. In 1625, Bernardo and Vincenzo were still living in the vicinity of James Towne.

The land on which the glass-house stood was included in a twenty-four acre tract sold by the governor, Sir John Harvey, to Anthony Coleman. In the

epochal year of 1624 the charter of the London Company was revoked, and Virginia began to be governed by the English king as a royal province.

We have no way of knowing if the output of the mint was "vilified," nor have we any satisfactory evidences of other kinds of glassware made there than the Indian beads. The Pennsylvania Museum of Art, at Philadelphia, and the Toledo Museum of Art display beads attributed by Dr. Edwin AtLee Barber to the Jamestown works. Glass beads bearing a strong Venetian influence have also been unearthed from Indian graves along the coast from Rhode Island to Florida. While a recent work on American glass states that these beads "were made in great quantity," I believe that the opposite is true.

Beads catalogued as "Jamestown" are in some cases very thin and fragile; in others, heavy and coarse. They are found in red, blue, green, and white opaque colorings. The forms may be oval, circular, or cylindrical. They may be decorated by flecks of contrasting color or by threads of glass incised or applied to the body. The Italians evidently amused themselves by employing as many different shapes, colors, and combinations as was possible with their limited facilities. That these fragments are diverse need not make one skeptical, and there is every reason to believe that other interesting specimens will be found in the future.

CHAPTER IX

THE SALEM GLASS-HOUSE

Salem, Massachusetts, formerly known as Naumkeag, was "promoted by the Council established at Plymouth in the County of Devon, for the Planting, Ruling, Ordering, and Governing of New England in America." It was under the special jurisdiction of the Company of Massachusetts Bay. The early Puritan and Quaker settlers soon had their troubles with the authorities in England, for almost immediately there arose difficulty in paying the excessive price placed upon imports to the New World. By 1639 the depreciation in the value of corn and live stock (both of which were being raised around Salem) stimulated the colonists to try their hands at home industries.

Roger Williams's successor, Hugh Peters, organized a company for the fisheries, which had hitherto been controlled and carried on exclusively from England. Thus Peters was more or less responsible for our first act of industrial independence, which eventually led to the Revolution. After this initial break in the control of trade, ship-building was begun, for Salem was a town that did things; and in two years' time six vessels were launched and put to sea, touching Madeira, the Canaries, Spain, and other countries. The colonists exported staves of dried fish, and the returning ships brought cargoes of dried fruits, wines, and sugar.

It was a momentous decade. Hemp was cultivated,

and "the fabric of linen, cotton and woolen cloths was set on foot." Rum was soon brought from the Barbados in great quantities, and termed "Kill-Devil"—an early variation of "the Demon Rum." Excellent varieties of apples abounded in the vicinity. Cider was made and shipped to the Carolinas and the West Indies, where it attained great popularity, surpassing, it was contended, any cider from the orchards of England. The dwellers along our southern coast developed a great fondness for this drink. It was only natural that, with the advent of these imports and exports, Salem merchants should demand bottles.

The territory included within the recognized limits of Salem comprised the present towns of Danvers, Beverly, Manchester, Marblehead, Peabody, Middletown, and parts of Topsfield, Wenham, and Lynn. The port was gradually assuming an ever busier atmosphere. Indigo was imported, and contracts with the islands of the seas were being entered into for the benefit of commerce.

In 1639, Obadiah Holmes and Lawrence Southwick formed a partnership to launch a glass-industry. A year later they persuaded Ananias Concklin, a practical glassman, to join them. Both a location and funds were necessary before anything could be started; and in 1641, more than ever convinced that a furnace would pay, they petitioned the governing powers for aid. In the Records of the Colony of Massachusetts Bay, we read:

> It was voted, that if the Towne of Salem lend the glasse men £30, they should bee alowed it againe out of their next rate, & the glasse men to repay it againe, if the worke succeed, when they are able.

The Salem Glass-House

The glasshouse stood about 550 feet south of the old Quaker Cemetery; Aborn Street now runs through the original glass-house dump.

From the first firing in 1641 until 1643, glass was melted sporadically. In the latter year operations temporarily ceased, the Concklins (a brother of Ananias was now connected with the works) becoming extremely dissatisfied. In 1645 an effort was made at reorganization. Some writers believe that the house operated intermittently until 1661; others, that it drew its fires for the last time in 1643.

In Volume II of the Records of the Massachusetts Bay, under date of October, 1645, we find the following:

Upon ye petition of Cauklin & Ananias Coukdayne (who have bene implied about ye glasse works, wch ye undertakers have for ye three yeares neglected) y^{t} they might be freed from their engagement to ye form'r und'rtakers, & left free to irgue [argue] with such as will forthwith do ye same, the Co^{t} [court] conceive it very expedient (in regard of ye publike interest) to grant this petition, pvided y^{t} if any of ye pties interested shall (upon timely notice) shew cause at ye next Quarter Co^{t}, at Boston, w^{r} upon ye magistrates shall indge it equall y^{t} ye petition shalbe defered to ye next Genrall Cort, oth^{r}wise ye petitions shalbe at liberty, according to their desire.

The "Glass-House Field," as it was termed, appears on the plan of Great Pasture, as drafted in 1723. Some persons are of the opinion that this was a window-glass house; others, that various utensils, including a number of lamps, were made, and that no window-glass was blown. I am inclined to think that the output included roundels or bull's-eyes, thick coarse-metaled lamps, pans, and heavy squat bottles.

I have seen four containers, almost identical, in four separate States, found by four different persons. Three of these were dug up in or around Salem; the other was found in Georgia. Each owner feels certain that he has a Salem bottle, although indisputable proof is lacking in every instance. The bottles closely resemble the English ones of this period, and were undoubtedly copied from those sent over from the mother country.

Any one finding a Salem product in the Indies would unquestionably label it English or Dutch. But bottles traveled far and wide, their ultimate destination often being thousands of miles from the furnace wherein they were changed from sand, lime, and soda, into glass. Many of Salem's early records were destroyed in the great fire of 1774, but it is said that one of her first merchant princes who helped convert the little fishing village into a world-famed maritime town shipped Holmes & Southwick's containers, filled with cider, to many a port.

The dour atmosphere of intolerance and religious fanaticism left its mark upon one of Salem's glass-house owners. The gentle Quaker Lawrence Southwick (with no Chief Massasoit to save him, as in the case of his friend Roger Williams) was banished for his faith, in the dead of winter, to one of the islands off the bleak coast, where he starved and froze to death, suffering a martyrdom almost unbelievable in our day. And even to-day Salem has not been able completely to dispel this air of doom, nor escape from the fascinating elements of Orientalism and mysticism which still invest her. It is intangible. Possibly we should be sorry if her glass, also, were not mysterious.

CHAPTER X

JOHANNES SMEDES, OF GLASS-MAKERS STREET, NEW AMSTERDAM

New Amsterdam, the trading post of the Dutch West India Company, next claims our attention.

It was in 1609 that Henry Hudson sailed up the river that was named by the Dutch "Mauritius" (in honor of Maurice, Prince of Orange), later called the North River, and now known as the Hudson; but for a number of years after that the southern point of Manhattan Island was inhabited only by fur-traders and soldiers from the Netherlands. Actual colonization did not begin until 1623. Fort Amsterdam was begun in 1626.

By 1633, when Van Twiller became director-general, the settlement had grown from a few rude sod houses and a fort to the semblance of a village. Van Twiller brought one hundred and four more soldiers from Holland, one schoolmaster, and one pastor to establish the Dutch Reformed Church on American soil. The following year Fort Amsterdam was rebuilt, a church and a parsonage were erected for Pastor Bogardus, and a house for Director Van Twiller; various mills started the grinding of grain, and the Dutch West India Company "caused a dwelling, barn, boat house, brewery, and other buildings to be erected" on Farm, or *Bouerie* (Bowery), Number One. During the time of operation of the New Amsterdam glass-house, a

few "handsome" buildings covered with tiles from Holland were added to the growing village.

Peter Stuyvesant had arrived in August, 1647, replacing Director Kieft, who had been drowned. By 1655 the troubled state of affairs in New Netherland, brought about more or less by Kieft, had been greatly improved by the determined Stuyvesant. In 1653 the latter adopted measures to prevent the threatened New England invasion of the island of Manhattan; but in 1656 New Amsterdam started upon her real career. Fugitive Jews from Portugal and elsewhere, persecuted Bohemians, French, Italians, and Swiss, even persecuted sectaries from Massachusetts, each fleeing from some form of religious intolerance, sought refuge within her gates. Peter Stuyvesant himself had been intolerant of the Lutherans, but this entry into her port of many alien peoples was the birth of the greatest cosmopolis the world had known. By 1667 there were three hundred and fifty houses and three thousand souls in the little city—which in 1664 had become New York.

With the vanguard of the Dutch citizenry came Johannes Smedes, who must certainly have known something of glass-making in the Low Countries, where an important glass-culture had developed from secret importations of Venetian workmen. In 1654, Smedes received an allotment of land on the present site of South William Street, between Wall and Pearl streets; and as the path was soon referred to locally as Glass-makers Street, we may reasonably infer that other glass-promoters than Smedes built furnaces along the way. This was the first effort to localize the glass-industry in America.

These transplanted Dutchmen were in all likelihood

more familiar with the finer forms of glass than were the English. They possessed an innate love of decoration, being fortunate in never having had invasion or conquest stamp out their individualistic manner of expression in craftsmanship. There was just enough tenacity about these men and women to demand shining pewter and brass, Holland tiles and plates, glass goblets and bowls. There was a formality about their gardens which never became monotonous. Their tables soon groaned with good things to eat. Starvation and salvation were never synonymous in their code of ethics or their religion.

Johannes Smedes, like many of the men who came after him, simplified his name after a short residence in America. He became known as Jan Smedes or Smee; and Glass House Street, which he probably laid out, was soon called Smee Street. This became corrupted into Smith Street, and was later changed to William. Smedes's land-holdings lay just north of Hanover Square, and the year he sold his glass-works (1664) he bought a tract of land on Long Island, a favorite rendezvous of the well-to-do burghers. In 1658 we find a record of a lawsuit between him and one Routoff Jansen, who was suing him for the recovery of five beaver-skins. The Jansen family were glass-blowers.

The Dutch occupation of the island also ended in 1664, which may have had no little to do with Smedes's retirement to Long Island. He became a patentee of the Town of Newton under the famous Nichols (or Nicholls) Patent of 1666–67, from which the promoters reaped a rich harvest. Many an acre reverted to the promoters in default of payment on the part of the purchasers, the lands not being "seated" (occupied) within a period of three years. In 1670,

Smedes was appointed road commissioner. The following year he died at his home in Dutch Kill.

What Smedes made at his glass-house is entirely a matter of conjecture. Probably roundels or bull's-eyes for the Dutch doors and windows, bottles of good dimension (for the place soon abounded in grog-shops and breweries), household utilities, mortars and pestles, and "chymical" wares. There is a likelihood that these glass-blowers on Smee Street employed browns and greens, possibly dark blues, in the making of their wares, and undoubtedly many specimens which are attributed to South Jersey are theirs. The Dutch were too careful of their household belongings to make it possible for all of this glass to have been broken. It was, we assume, heavy and durable. I may appear radical, but there are two important pieces of glass in one of our leading museums which I would label "Johannes Smedes" without being able clearly to explain why.

The Jansens, after their apprenticeship under Smedes, became independent manufacturers, as did also Cornelius Dirkson. By 1674 free trade with Holland and the right to be goverened by the Dutch law, secured by the original capitulation, were extinct. We can find no records stating how long these various glass-houses operated. It is possible that the island of Manhattan was never long without a manufactory of this kind, until within the last century. All races, all peoples, all sects still enter her gates, as of old, but her great ships now carry our glass to all the ports of the world.

We are likely to forget (if, indeed, we have yet realized) that more early glassware was made in New

York and Brooklyn than in any other one spot in America, with the exception of Pittsburgh. Few collectors ever speak of "New Amsterdam" or "New York" glass, but the day is not far distant when her neglected houses will cry for recognition.

CHAPTER XI

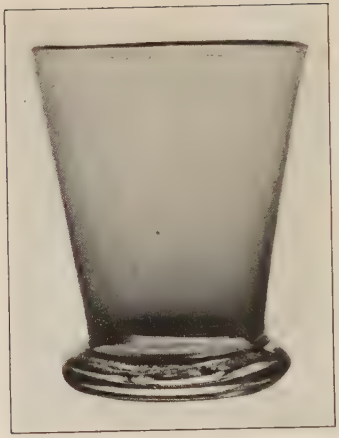
EVERT DUŸCKING, ARTIST AND ARTISAN. EARLIEST EXPERIMENTS IN PENNSYLVANIA AND NEW JERSEY

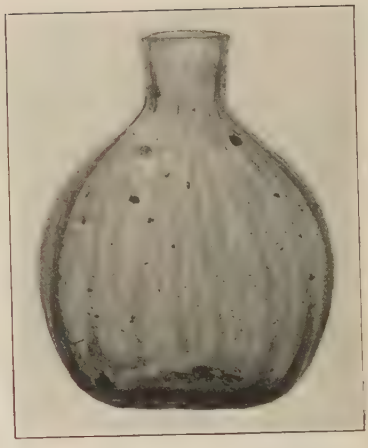
The name "Everett Duÿcking" is a study in nomenclature. In records preserved by the New York Historical Society it is spelled in seven different ways. Village clerks and writers of baptismal certificates, records, and wills were notoriously poor spellers in the seventeenth century. The Dutch names were particularly hard to handle. Owing to the fact that the final "g" in Dutch has almost the sound of our "k," Duÿcking was variously altered to "Duÿckengk," "Duÿckinck," and "Duÿckink" about the year 1700.

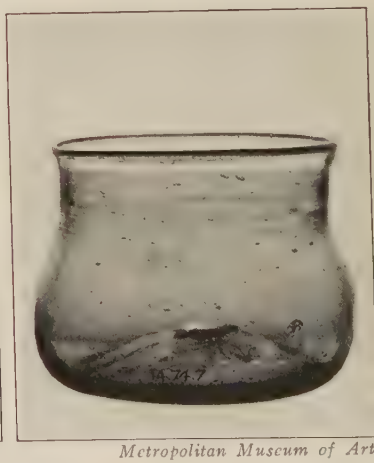
Evert Duÿcking came to New Amsterdam in or prior to 1638, from Borken, a town in North Brabant. The settlement still had chimneys made of sticks held together by clay; little shops for the sale of tobacco and beer were the gathering-places for the soldiers and traders. Duÿcking lived to see the trading post pass through various vicissitudes, until it had attained the proportions of a large and thriving town. His name appears upon the records of 1638, and, five years later, upon the first map of New Amsterdam (New York), as the owner of village lots granted by the Dutch West India Company—lots which lay on the Old Dutch Road, now Beaver Street, near the Common Ditch, and were but a short distance from Hanover Square. He was employed in some capacity by the company,

PLATE 1 *Mrs. Mary Sampson*

Opalescent insufflated pitcher (1820–38)







Metropolitan Museum of Art

PLATE 2

Early glass made from poor grades of silica (1750–1820)

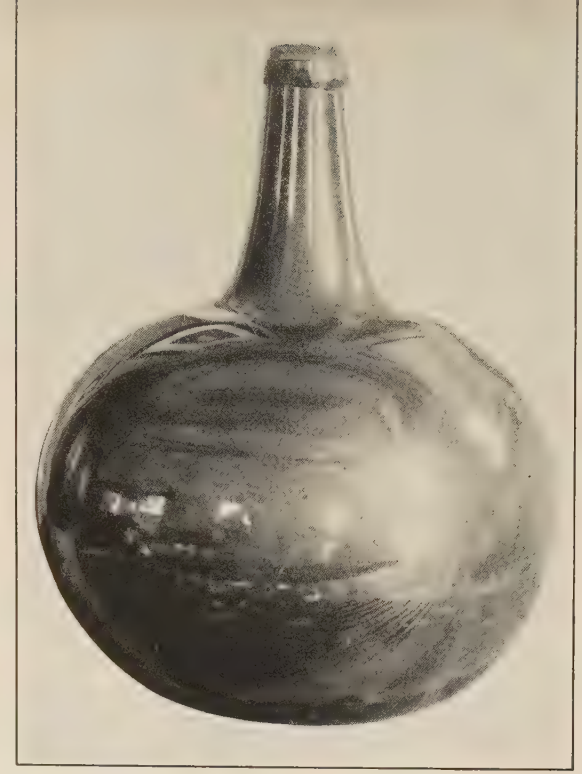


PLATE 3

Pitkin demijohn

Mr. W. S. Walbridge

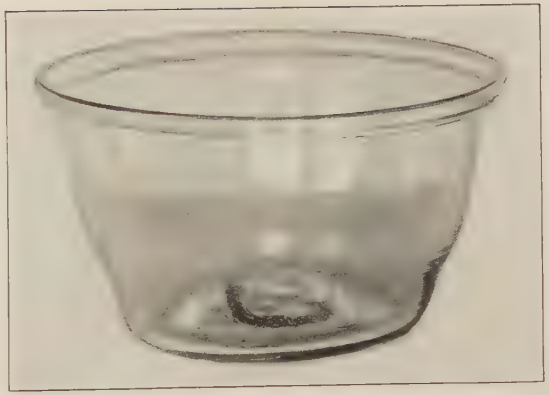
Bottle dug up near Wistar's works

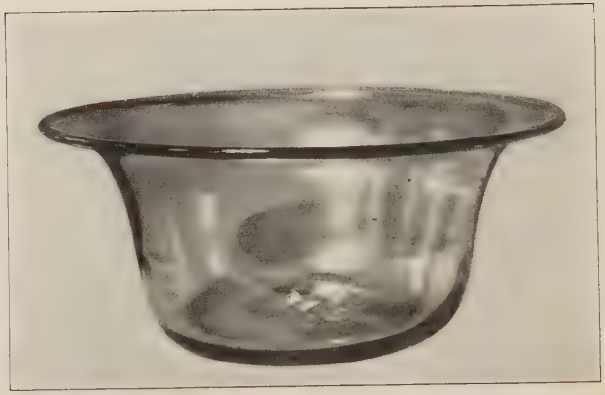
PLATE 4 *Metropolitan Museum of Art*

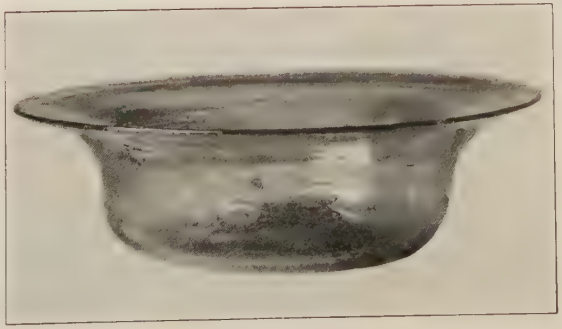
Wine-glasses made by American glass-houses after European prototypes (1768–1830)

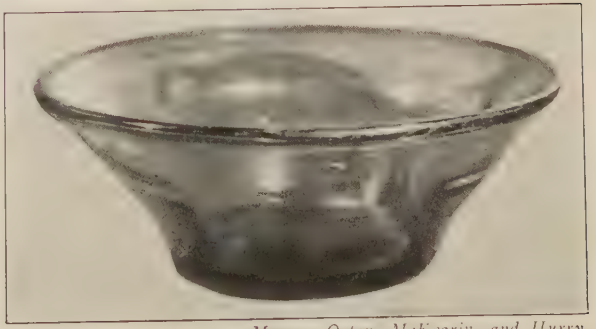
PLATE 5 *Mrs. N. McLean Seabrease*

Wistar amber bowl on footed standard (1760–70)









Messrs. Orton, McKearin, and Hurry

PLATE 6

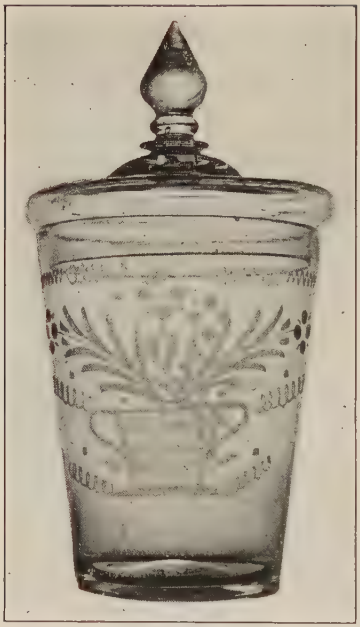
Redford Bowl
Pan attributed to Amelung

Bowl attributed to Gallatin
Bowl attributed to Wistar

PLATE 7

Mr. Wilson Heisey

Mahogany mold models salvaged from the Sandwich factory (1850–70)



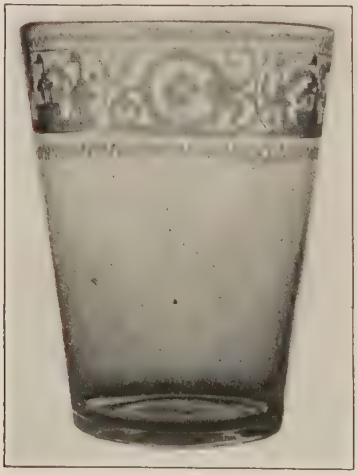


PLATE 8

Metropolitan Museum of Art

Types of engraved glass introduced by Bayard-Bamper or at Manheim

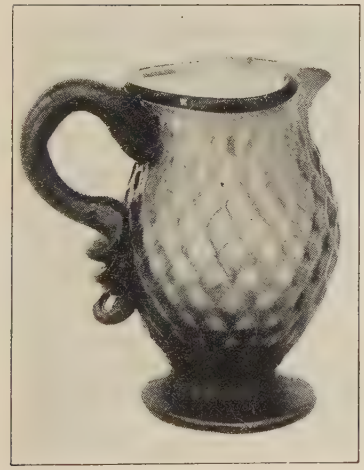
PLATE 9 *Mr. Henry V. Weil*

Cobalt flint-glass made near the Pennsylvania-Maryland border (1769–1830)

PLATE 10

Mr. Stephen Van Rensselaer

Travelers' bottles formerly encased in wicker covering
Types of snuff and apothecary jars
Gimmal bottles



Metropolitan Museum of Art

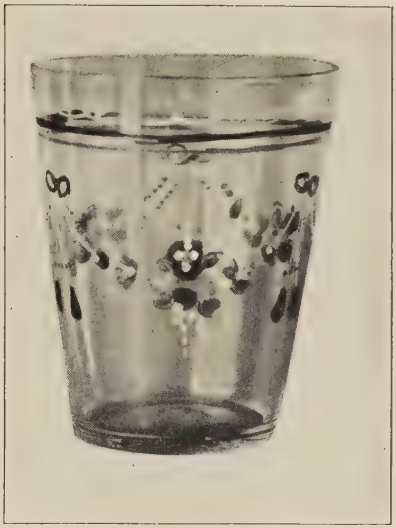
PLATE 11

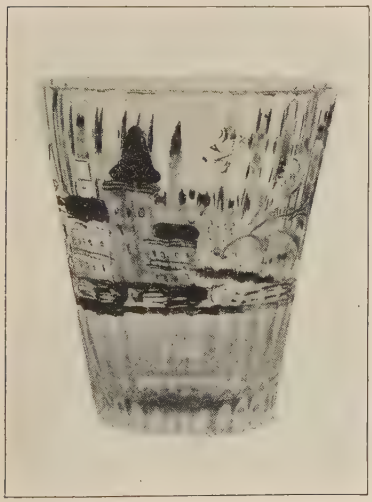
Exceptionally fine pitchers, Pennsylvania-Ohio types (1769–1830)

PLATE 12

Mr. Israel Sack

Cobalt covered flint blown bowl—probably Stiegel





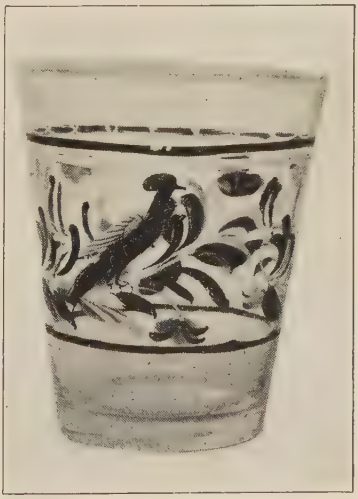


PLATE 13 *The Toledo Museum of Art; Metropolitan Museum of Art*

Types of enameling as practised by German-American workmen

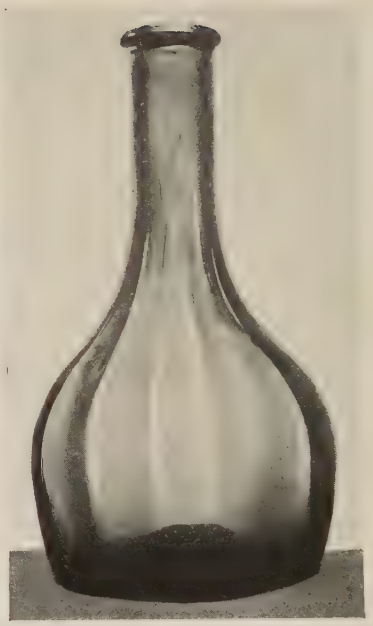
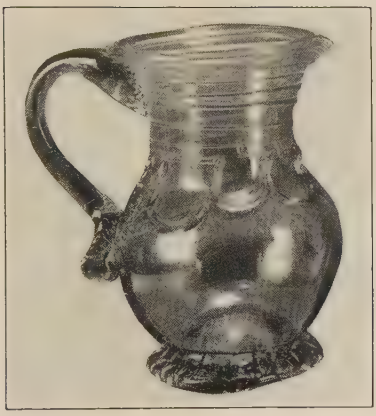


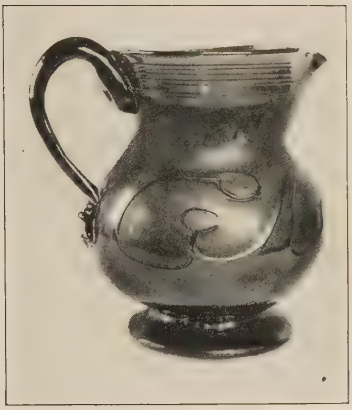
PLATE 14 *Messrs. Wessen, Van Rensselaer, and West*

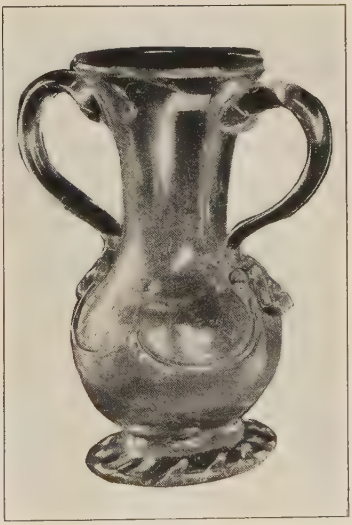
Rigaree decorated gimmal bottle attributed to the Olive or the Harmony Works at Glassboro

Medford cobalt bottle

Ohio River types of light green pitcher and purple cruet







Mr. David Belasco; "Antiques"

PLATE 15

Examples evidencing South Jersey technique—attributed to Redwood, Stoddard, Millville

Mr. George S. McKearin

PLATE 16

Light-green Sand-Lake jar and pitcher—probably blown by the Gabler brothers

and in 1640 was stationed at Fort Hope, the present site of Hartford, Connecticut.

Shortly after this date the trouble between the New Englanders and the New Amsterdamers reached a climax, at the "House of Good Hope," and Duÿcking returned to the lower part of Manhattan Island, where he married Hendrickje Simons (1646) and resided on Hoogh Straat, now Stone Street. In 1654, Director Stuyvesant gave him a patent for twenty four morgens of land in Flatbush, Long Island, which he sold four years later to Corlears Van Ruyven. In 1664 he took the oath to the English king, and ten years later was holding the important office of firewarden. When an aged man, respected and admired, he had the honor of being admitted as a freeman of the City of New York (1698), and in his advanced years he was also an active member of the Committee of Supervisors of Repairs of Public Buildings. It is thought that he died in 1702. The following year the family of the "Widow Duÿckenck" was listed as being composed of "2 females, 8 children, 4 negroes, 1 negress, 2 negro children."

Evert Duÿcking "grew up with the town." He was versatile, artistic, capable, and sensible—a man who had time for family, friends, business vocation, avocation, and public service. We feel that his glass-house was conducted along successful and practical lines, and that he was one of the very few glass-makers who did not suffer financial loss in the undertaking. This man from Brabant was a "limner," or painter of portraits, a painter and stainer of glass, a glazier and a "burner of glass." Although he was not to be compared in talent to his friend Jacobus Strÿker, the artist, their lives ran parallel in several ways. Both

were pillars of the Dutch Reformed Church; and while Strÿker painted the portraits of its leading members, Duÿcking executed their coats of arms upon the windows of this famous house of worship. On one occasion some trouble arose regarding payment for this work, for we read:

> Evert Duÿcking requests by petition to be informed from whom he is to receive payment for the glass which he put in the Church for Schout, Burgomasters and Schepens, demanding 2½ beavers for each. The Court decides that petitioner shall go to each one for whom the glass was for, his payment either in trade, or as he can agree for the same.

Duÿcking had two sons, one of whom was the mate who brought the Labadist Fathers to America; the other, Gerrit, followed in his father's footsteps, and became an artist and artisan. When the Labadists visited Esopus, they took Gerrit with them as a companion, and in 1658 father and son executed the colored-glass windows for their new church on Long Island.

Evert retired from the active management of his glass-works in 1674, and was succeeded by Jacob Melyer, whose descendants, "unto the third and fourth generation," are said to have made glass in New York. Here is real work for the patient research worker. If the Melyers manufactured glass unto the third and fourth generation, it is only logical to assume that glass was being blown on the island of Manhattan consecutively from 1645 to 1767, when the Glass-House Farm furnaces probably drew their fires.

If the Duÿcking and Melyer factories were, in the main, window-glass works, each undoubtedly had a "corner pot" (as was the custom) for bottle-making,

the last "run" of glass in the pot frequently being used for this purpose. We cannot believe that these Dutch glass-workers refrained from "offhand" blowing, or that household utensils, blown tableware, and apothecaries' supplies did not come from these furnaces. A portion of the glass heretofore classed as Wistarberg was undoubtedly made at New York.

The mystery of the Chester Creek Glass Works is unsolved. Evidence regarding the factory is so contradictory and controversial that the attempt to unravel the obscure data has so far proved futile. The small factory was probably built in 1683 on Chester Creek, Delaware County, Pennsylvania, at the instigation of the Free Society of Traders, and operated for the duration of a few months or a year at the most.

Joshua Tittery of Newcastle-on-Tyne landed in Philadelphia on June 20, 1682, from the ship *America*. He had previously been indentured to the Traders' Society for a period of four years, and was brought to the provinces to manage a glass-works, the sum of £88 sterling per annum being stipulated as his salary. William Penn, in a letter written August, 1683, refers to a tannery, a sawmill, and a glass-works in or near Philadelphia, the last two "conveniently posted by water-carriage."

Weeks, in his "Report on the Manufacture of Glass" (1883–84), states that it is doubtful if the Philadelphia works, after being erected, was ever used for glass-making. If so used, it was soon abandoned. Budd, writing of Philadelphia and its environs in 1685, does not mention a glass-house. A letter written by Dr. Moore, printed in 1687, lists a number of industries in this section, but does not include that of

glass-making. A pamphlet was printed in 1691, entitled "Letters and an Abstract of Letters from Pennsylvania," in which all the trades which at that period flourished in the province are recorded, but there is no mention of this industry. Window-glass is known to have been so scarce in Pennsylvania during the latter part of the seventeenth century that isinglass was used as a substitute.

Bishop, in his "History of American Manufacture," states that a glass-house was built at Frankfort, near Philadelphia, shortly after the Chester Creek works was erected, and that it was promoted by the English Friends; but Weeks remarks that this was probably a mistake, for there were no English Friends in Philadelphia at this date. Mr. F. D. Stone, librarian of the Pennsylvania Historical Society in 1883, wrote to Weeks saying that Pastorious was the agent for the Frankfort Land Company, and that Bishop had probably confused this name with the little town of Frankford, now a part of Philadelphia. From this time on to the advent of Stiegel, the history of glass-making in Pennsylvania is, as Weeks remarked, "a blank."

There are echoes of a very early glass-works situated on the Mullica River in New Jersey, concerning which little or no authentic data has come to light.

A semi-mythical glass-house is said to have operated at Brown Pines, New Jersey, prior to 1776. This factory has been referred to as the New Jersey Window Glass Company. Crude bottles are supposed to have been blown at this works.

PART III

The Second Period, 1737 to 1827

CHAPTER XII

CONDITIONS OF THE TIMES

The most important period of the flowering forth of our native arts and crafts, covering the years from 1737 to 1827, was an epoch in which our architects, cabinet-makers, silversmiths, potters, and glass-blowers adapted and developed a fine feeling for line and decorative motif. But unfortunately, while our historians acclaimed the utterances and the deeds of a Thomas Jefferson or a Paul Revere, in relation to national politics and policies, they ignored the splendid manipulation of brick and wood, copper and silver, achieved by those men. The result is that many a creator who worked with the brush, the loom, the throwing-wheel, and the blowpipe has vanished from our annals. We are now attempting to resurrect a few of these forgotten artisans by such meager records as we are able to find in old advertisements, labels, almanacs, and local histories; and as we bring back a little of this lost world we marvel that so much was accomplished under the then existing conditions.

The eighteenth century in colonial America was a time of uncertainty and turbulence. Intercolonial wars followed one another, while taxes, duties, and embargoes produced a chronic state of turmoil. The provinces had, however, developed a well-to-do class of people, cities such as Charleston, Richmond, Philadelphia, Providence, and Boston claiming an aristocracy whose chaste and dignified dwellings were the finest examples

of architecture our land has ever known. The furniture and furnishings in these homes were in accord with their exterior and interior beauty. Such excellence was achieved esthetically that we ponder in amazement at the decadence which followed.

The amount of glass imported into this country steadily increased. Bavaria, Germany, England, and Ireland sent enormous shipments of bottles, tableware, and decanters after 1740. Cork exported quantities of fine glass to the American market between 1752 and 1804. In 1780, England alone sent in forty thousand drinking-glasses, and in 1801, eleven thousand. Sweetmeat-jars, salts, decanters, carafes, and punch-bowls came in vast numbers. In 1810 a New York merchant advertised that he had just received a consignment of "45 casks of glassware . . . cut and plain . . . 120 hampers of wine bottles, 1 groce each, 500 Hampers Bristol porter bottles."

In 1719, becoming alarmed at America's effort to establish industries of her own, the British House of Commons passed a resolution "that the erection of manufactories in the colonies tended to lessen their dependency on Great Britain." The mother country tried in vain to suppress the iron-furnaces; New England had six furnaces and nineteen forges in 1721, and was even more active in this respect than Pennsylvania (much of the latter province then being a wilderness). In 1733 the colonists started to make rum out of molasses purchased from the French, thus becoming independent of the British sugar islands. The resulting Molasses Act developed two things: our bottle-industry, and molasses or rum runners. Bottle-making soon became as important a part of the colonial glass-industry as window-glass making.

In May, 1767, Mr. Townsend introduced in Parliament his plan "for drawing a revenue from the Colonies without giving them offense," a thing which the Stamp Act had failed to do. The Townsend Act included duties on glass, tea, pasteboard, painters' colors, and paper-hangings imported into the colonies, the resulting revenue to be appropriated to the support of the civil government in the colonies, thus "by all prudent ways and means, to encourage the Manufactures of British America." Glass and "paper-ware" (wallpaper) were designated as deserving particular domestic encouragement. After a reluctant assent to this expedient, an ineffectual attempt was made by the ministry to enforce it, especially in the Northern provinces. But the bill was repealed in March, 1770, retaining only the tax on tea, which led to our famous Boston Tea-party.

Previous to this bill's repeal, Stiegel had started, at great expense, his flint-glass factory, whose scope was to be much broader than anything before attempted. It was argued and believed that such a domestic glass-works would save the provinces an annual taxation on glass valued at £30,000. Without question, Stiegel consulted many of our influential colonists before undertaking the work.

Our Declaration of Independence and the events following temporarily crushed many branches of industry. Every one of the few glass-works then existing in America was wrecked by the war or its aftermath. After the ending of hostilities, conditions gradually stabilized, and the new nation faced the fact that it must develop its own manufacturing interests.

After the apathy which followed the Revolution had somewhat abated, the economical and social con-

ditions of the country were still far from normal, owing in part to the ever increasing restlessness of the young ex-soldiers and their desire to go West. The weak, the crippled, and the injured also lacked the stamina to enter trade and to build up the lagging or abandoned plants. All over the youthful States, little groups of citizens held indignation meetings and proffered much free advice as to how to start the wheels of industry, in order to stem the tides of imports again on the increase. Little promoting companies were formed, many on paper only, and occasionally a factory would be taken over for operation.

In a few years every one living adjacent to silica-beds wanted to make glass. An epidemic of small attempts of this sort spread about the Berkshire sand district and the New Jersey beds. Had it not been for the ever recurrent conflagrations, poor pot-clays, a dearth of glass-blowers, the inebriate and nomadic tendencies of the workmen, the high cost of transportation, political agitations, panics, land-bubbles, and a few sporadic skirmishes, and wars, the country would have been swamped with glass. But these unforeseen forces carried nearly every high hope down into the waters of oblivion. And in addition the timber, so necessary as fuel, always became exhausted before the calculated time.

General courts or legislatures frequently granted glass-making privileges to groups of organizers, with clauses in their charters stipulating that the plants could be operated as potteries or brass or iron works, in case it was found expedient to shift from the original industry.

Many of our early glass-houses were situated in isolated spots with few educational, religious, or social

advantages. Supply stores were opened by the glass-house owners. Pork, beans, molasses, rum, brown sugar, a little salt and flour were sold over the counter; shinplasters, or tokens, took the place of government specie as a medium of exchange.

Glass-making in remote stretches of timber country eventually gave way to centralized industries on navigable rivers or near the ocean, the opening up of the West bringing about many material changes and improvements in connection with the discovery of new sand, clay deposits and coal-beds. The West soon absorbed and assimilated the Eastern operatives, appropriating their technique (as was inevitable) up to at least 1830, and in many cases much later.

After 1783, men from New England to Virginia, grown bold in their newly acquired spirit of freedom, risked all, and frequently lost all, in manufacturing enterprises; but, still venturing, managed to leave us tangible evidences of having walked on earth.

CHAPTER XIII

CASPAR AND RICHARD WISTAR

Caspar Wistar, son of Johannes Caspar Wistar, the Fürstenjäger or electoral huntsman to Carl Theodore of Bavaria, was born in the electorate of Heidelberg, now the Duchy of Baden, in 1695. At the age of twenty-two, Caspar set sail for America, arriving in Philadelphia September 16, 1717, coming direct from Hilspach. This district in Germany, a section of the Palatinate, provided our country with many glassmen, who gave our production a considerable portion of its merit.

After paying his passage to the New World, young Wistar found his funds sadly depleted. Possessing courage, ambition, and the determination to succeed, he managed to save enough capital, after a few years' work in Philadelphia, to embark in a business of his own—that of making brass buttons. He joined the Society of Friends in 1725, and although the Quakers eschewed any article as ostentatious as a shiny button, this fact did not prevent him from manufacturing the article, and in a short time he had built up a large trade.

The fundamental reason why Wistar became a Quaker may have been that he had fallen in love with Catherine Jansen of Germantown, an attractive Quakeress whom he married in 1726. A year later, on June 7, 1727, a son was born to this union and given

the name of Richard. Within a short time we find Caspar assuming a place of importance in the life of the city. The Jansens may have helped their ambitious young son-in-law, for the brass-button business soon grew to such proportions that he felt that a man of his position should branch out into other lines of manufacture. He decided, astutely, that one of the crying needs of the day, in the provinces of Pennsylvania and East and West Jersey, was glass in its various forms. The glass-houses on Manhattan Island had undoubtedly supplied a limited amount of this ware, and importations of window-glass and bottles came into the ports in an intermittent manner. But there was never enough to supply the increasing demand.

On the advice of his friends, Wistar took the important step of attempting to manufacture window-glass and various kinds of bottle-glass. The venture required both courage and capital. The purchase of timber for fuel, the construction of pot-houses and furnaces, the importation of glass-blowers whose efficiency was equal to the making of this glass—all constituted a long step forward in the history of colonial New Jersey industry.

Records in the New Jersey Historical Society state that on January 7, 1738, Wistar bought one hundred acres of wooded land from Clement Hall. This was shortly followed by the purchase of a thousand-acre tract from Amos Penton and, in two years, an additional piece of timber from Amos Hilton—the land bordering on each side of the highway from Salem (eight miles distant) to Pilesgrove. Various accounts of Caspar and Richard Wistar's land purchases differ regarding the acreage; but all in all, over two thousand acres were gradually acquired. This land lay adjacent

to a small branch of Alloway Creek, and a little more than two miles from Allowaystown. A part of the ground was cleared; cordage, pot, and glass houses, a general store, homes for the workmen, and a mansion-house for Wistar's personal use, were built. Unfortunately, scarcely a stone now remains of what was once a prosperous glass-works community.

Wistar sent to Belgium for four expert glass-workers —Caspar Halter, Johann (John) Martin Halter, Johann Wentzel (John William Wentzell), and Simon Kreismeyer (Greismeyer). They sailed from Rotterdam, Holland, on December 7, 1738, arriving in Philadelphia in the spring of 1739, their passage costing Wistar £58, 8 shillings, paid to Captain James Marshall. The agreement entered into between Wistar and the four Belgians included an advance of all necessary funds for their actual expenses, and suitable provision of land, homes, fuel, food, and servants. Wistar was to furnish all materials for the glass-making, including pot-clays, silica and its fluxing ingredients, minerals for coloration, molds, tools, and whatever the requirements of the men might be. They were to receive one third of the profits accruing from the sale of the finished product. The Belgians agreed to teach the secret art of glass-making to Wistar and his son Richard. This was one of the first coöperative industrial ventures in our country.

Under the watchful eye of Caspar Wistar, the works was launched as scheduled, trade contacts established, and the business of glass-making started in earnest. Soon the general store became the focal point for the inhabitants from miles around. In winter it was the destination of merry sleighing parties in gaily painted sleds, with jingling bells above the horses' fancy yokes.

We take the following interesting extract from the First Series, Volume VI, of the New Jersey Archives:

To Thomas Hill, Esq., Secretary to the Lord's Comsrs. for Trade and Plantations.

Sir:

Mr. William Frasor, Collector of the Customs of Salem in West Jersey having informed the Commissioners, that there has lately been erected a Glass Works within Eight miles of that Port by one Caspar Wistar, a Palatine, and is brought to perfection so as to Make Glass: I am directed to give you an account thereof for the Information of the Lords of Trade,

I am Sir

Your most humble Servant

Custom ho. London — Chas. Carkesse.

31: July 1740

The works expanded. Richard learned the business from the ground up. In 1748 other workmen were brought from Holland, the surnames of some of them being Ridman, Sowder, Knieal, Tabal, Dielshower, Froelinger and Freas (two or three of these names were soon Anglicized).

Caspar Wistar died in 1752, in his fifty-seventh year, leaving his button-works and glass-works to the supervision of Richard, with the stipulation that a younger son, Caspar, should annually receive "700 ft. glass of specified sizes, 3½ doz. bottles." Richard soon made several changes, moving from the old family home on Market Street, Philadelphia, to "another establishment in the same street next door to the Spinning Wheel," at which place he also negotiated the sale of the buttons and glass. He personally managed the Philadelphia factory. Benjamin Thompson became resident manager of the New Jersey

plant, and he and Richard enlarged its pot-capacity for the carrying on of a more extensive business. It is well to remember, however, in gaging the production of our seventeenth and eighteenth century glass-houses, that they operated only from six to eight, or possibly nine, months out of the twelve, the conditions and strain under which the men worked making imperative a long rest each year.

Industrial conditions in the colonies were at low ebb; foreign and internal troubles were working havoc with trade in general, at the time of Caspar's death and the enlargement of these industries by his heirs. Provincial governors, attempting to bring order out of chaos, only seemed to make matters worse. All sorts of subterfuges were resorted to in order to confuse English knowledge of the state of American industrialism, commerce, and politics. Ambiguous messages were sent by our leaders of the day to those in high authority in London.

On August 19, 1752, Governor Belcher of the Provinces of Jersey wrote to Colonel Alford of Boston:

I am fully in opinion with you and my other Friends in New England that there is no Wiser or better Measure to go into for retrieving the Miserable Circumstances of your Province than to promote Manufactures among Your selves and at the same time to be practicing economy and all possible Frugality and I have often wondered that Gentlemen of Substance have not long before this Set up a Glass House for which you are much better Accomodated than any one can be in this Province where such a work has already turned out to great profit.

But you put me upon a Hard Task to procure you any Tolerable Information as to the Carrying on of these Works here in which the managers are very close and Secret however

I will take all prudent steps I can to make you an answer in this matter and to get a Sample of the Clay you mention but as I am here at a great distance from those Works it will require time to Obtain what I desire for you.

In a later letter to Colonel Alford, Governor Belcher wrote:

I have begun to make Inquiry about the Glass Works in the Province w^{ch}: are 130 miles from this Town & I know no proper person near them capable of getting the Information you desire I have hardly a LEAN hope of rendring you any Service in that matter in which the Undertakers are very close & Secret. I was well Acquainted with one Caspar a German who lived at Phil^{a}: and was the first and principel Undertaker of the Glass Works in this Province and whom I discours'd particularly about them (5 years ago) and he Complained to me that the Clay for the Furnace Bottoms was but poor and often gave WAY to their great damage and Complain'd also that they Cou'd not make their Glass so Clear and Strong for want of HELP, their Works being near two hundred miles from any Quantity of it.

This Caspar is lattly dead and from a very poor man rais'd and a left a Fortune of 20 to 3,000 pounds St^{r}. I have had from others Engag'd in the Works the same Complaint of want of proper Materials for the Mettle and for the Furnace and as I really think there can be no good or honest Intelligence gain'd from those Undertakers were I to Advise you you shou'd send to London for a Head Operator & 2 or 3 Skilful Assistants and at same time to bring with them a Quantity of Sturbridge Clay for your Bottoms if it can by any way or means be got aboard a Ship for its Exportation is prohibited upon a great penalty and yet my Fr^{d}. Contrived to send me 3 or 4 Hh^{ds}: about 30 years agoe for the Bottoms of my Copper Furnace—w^{ch} bad defyance to the Hottest fire but it was a very Chargeable thing to get.

The governor had heard that New York was becoming the seat of a new glass-factory, for which "five Skilful Work men" had been brought over from Holland or London.

In 1768, Benjamin Franklin, writing to his natural son, Governor Franklin, states that Mr. Grenville (of London) had complained to the colonial governors of New Jersey, New Hampshire, and East and West Florida of their failure to send accounts of the manufacturing in their respective provinces to Parliament; also, that, looking over the reports of other governors, he had found them unanimous in declaring that there was virtually no domestic manufacturing in their domains. Such reports were of course written purposely to deceive the British. This letter of Franklin's has been misinterpreted more than once in articles dealing with American glass, the authors taking the apparent instead of the veiled but real meaning. Such communications pulled the wool over Georgian eyes, as it was hoped they would do. An extract from Franklin's letter reads:

> I wish you would send your account before the meeting of the next Parliment. You have only to report a Glass house, coarse window glass and bottles, all the finer goods coming from England and the like. I believe you will be puzzled to find any other, though I see great puffs in the papers.

England was not to know that Wistar was trying to compete with foreign trade. It was naturally the Georgian policy to smother colonial efforts, and Franklin decided at the outset that what England did not know would not hurt her. This veiled suggestion is a masterly effort in evasion. Franklin, at the Court of St. James, never forgot that he was the delegate of a

people without representation. A portion of the report submitted by his son, Governor Franklin, in 1768, runs as follows:

A Glass House was erected about Twenty years ago in Salem County, which makes Bottles, and a very coarse Green Glass for windows used only in some of the houses of the poorer Sort of People [true enough, for some of the "poorer sort" had no glass panes at all]. The Profits made by this Work have not hitherto been sufficient it seems to induce any Persons to set up more of the like kind in this Colony: but since the late Act of Parliment laying a Duty on Glass exported to the Colonies, there has been a Talk of erecting others, but I cannot learn that any are yet begun: It seems probable that notwithstanding the Duty, Fine Glass can still be imported into America cheaper than it can be made here.

In 1769, when relations between the colonies and Great Britain were strained almost to the breaking-point, the merchants of Boston and Philadelphia, soon supported by those of Salem and New York, got together and drew up a non-importing agreement affecting both tea and glass. This was, temporarily, both Wistar's and Stiegel's great opportunity. We find Richard advertising in the "Pennsylvania Gazette" for that year:

Made at subscribers Glass Works between 300 and 400 boxes of Window glass consisting of common sizes 10 x 12, 9 x 11, 8 x 10, 7 x 9, 6 x 8. Lamp glasses of any uncommon sizes under 16 x 18 are cut on short notice. Most sorts of bottles, snuff and mustard bottles also electrofying globes and tubes etc. all glass American Manufacture. N. B. He also continues to Make the Philadelphia brass buttons noted for their strength and such as were made by his deceased father and warranted for 7 years.

There are few authentic records extant regarding the Wistars, either father or son. In fact, few if any records were kept in these colonial glass-houses, Stiegel apparently being more prone to set down the happenings of the day than the others. An elementary form of book-keeping precluded the possibility of copies, for there was but one ledger and one book of formulæ. When these latter were destroyed, as was frequently the case, little outside of newspaper advertisements and letters bearing upon the subject remained. The following—signed by Richard Wistar, Wistarburg,[1] November 6, 1767—gives us another glimpse of the difficulties of early glass-making:

Ten Dollars Reward. Run away from the Subscribers' Glass House in Salem County, West Jersey, A Dutch Servant Man, named ADRIAN BRUST, about 27 years of Age, 5 feet 7 or 8 inches High of a pale Complexion has short light Hair, two moles on his left Cheek and on his right temple a Scar, also on one of his Feet near his Ancle which is but lately healed, and the Shoe mended where the Cut was. Had on when he went away an old Felt Hat, a lightish coloured Upper Jacket with Brass Buttons, this Country make [undoubtedly Wistar's own] about half worn with a Patchone of the hind Flaps where there is a Hole burnt; an under one with flat Metal Buttons, both of Linsey, Leather Breeches, Grey Yarn Stockings, good shous with Brass Buckles, A good Shirt, and generally wears the Bosom Part behind.

The description is a classic. Somehow, we hope that Brust went blithely on his way, wearing bosom shirts in this most unconventional manner. Another boy who decamped was "addicted to play upon the Fiddle." The terrific heat of these early glass-houses caused the pre-

[1] Richard Wistar wrote the name Wistarberg "Wistarburg."

mature death of many a man, and the work was hazardous in other respects. We can understand the insurgent spirit of the younger generation, and their attempt to run away from such conditions.

Richard kept in close touch with the various ramifications of the business, being familiar with the most minute details regarding cost of production, quantity and quality of output, and social conditions connected with the work and recreation of his employees.

The Revolution hit the Wistar factory a body-blow. For a time Wistar weathered the trade depression, but glass-buying soon came to an absolute standstill. His prestige and finances were not great enough to tide him over until better times. America was wrecked industrially, and her successful men suddenly found failure, and frequently poverty, staring them in the face. The wastage of war took our glass with it.

In 1778 and 1779, Richard offered parcels of land for sale, hoping to avert the catastrophe of financial failure, but no one came forward to buy the fine orchards of fruit-bearing trees he had cultivated; nor could he sell fields of grain or wonderful asparagus-beds. The workmen took up arms. There were few left to blow glass, fell trees, or cut grain. On October 11, 1780, the glass-house property was put up for sale, including the mansion-house and ten workmen's homes —as is evidenced by the following advertisement in the "Pennsylvania Journal" of that date:

The GLASS MANUFACTORY in Salem County West Jersey is for sale with 1500 Acres of Land adjoining. It contains two Furnaces with all the necessary Ovens for cooling the Glass, drying Wood, etc. Contiguous to the Manufactory are two flattening Ovens in Separate Houses, a Storehouse, a Pot-house, a House fitted with Tables for the cutting

of Glass, a Stamping Mill, a rolling Mill for the preparing of Clay for the making of Pots; and at a suitable distance are ten Dwelling houses for the Work men, as likewise a large Mansion House containing Six rooms on a Floor, with Bake-house and washhouse; Also a convenient Store-house where a well assorted retail Shop has been kept above 30 years, is as good a stand for the sale of goods as any in the Country, being situated one mile and a half from a navigable creek where shallops load for Philadelphia, eight miles from the county seat of Salem and half a mile from a good mill. There are about 250 Acres of cleared Land within fence 100 whereof is mowable meadow, which produces hay and pasturage sufficient for the large stock of Cattle and Horses employed by the Manufactory.

There is Stabling sufficient for 60 head of Cattle with a large Barn, Granery and Waggon House. The unimproved Land is well wooded and 200 Acres more of Meadow may be made. The situation and convenience for the procuring of Materials is equal if not superior to any place in Jersey.

For terms of Sale apply to the Subscriber in Philadelphia.

RICHARD WISTAR.

Wistar died before anything was done toward a sale of the property, passing away at Rahway, New Jersey, in 1781. His will empowered his executors either to lease or to sell the property, much of which had been denuded of virgin timber and was now under cultivation. Richard's wife, Sarah, and their son John tried to operate the works, but the times were more than they could cope with. Glass-making was soon abandoned and the furnace fires drawn for the last time.

While it has been repeatedly asserted that Caspar Wistar was the first successful glass-maker in America, this is probably an error, Johannes Smedes or Evert Duÿcking surely deserving this distinction. Five

houses—Richard Wistar; Stiegel; Bakewell, Page & Bakewell; the New England Glass Co.; and J. & R. Fisher of New York city have been said to be the "first successful flint-glass makers" in our country. For all we know, Manhattan flint-industries may have manufactured glass successfully contemporary with Stiegel. There is no proof whatever that Wistar made flint-glass. The commercial production advertised by him consisted mainly of window-panes, bottles, and snuff-canisters. The early output is supposed to have been coarse and crude.

The following statement may come as a surprise, even as a shock, to many collectors, but it is now conceded by students of the subject that less than thirty pieces of Wistar glass have so far been satisfactorily authenticated. Most of the glassware formerly sold and collected as "Wistarberg" is now described as of "South Jersey technique," although much of it was made many miles removed from the State of New Jersey—in upper New York State and New England, and some of it in the then middle West. Starting from false premises about 1910, dealers, collectors, and writers continued to add to, instead of to correct, the current misconceptions, until about 1920, when the patient research of a group of men (also dealers, collectors, and writers) began to reveal that we had fallen into a seemingly bottomless pit regarding attribution of old glass. All but a very few now admit these errors, and are trying by every means to correct them. Therefore we cannot describe the output of Caspar Wistar's furnace much more accurately than we can that of Lodewÿck Bamper's or Evert Duÿcking's. Artisans such as Mat Johnson at Stoddard, Allan Gabler at Greensboro, George Reppert in Baltimore, Oscar

Granger of Saratoga, Frederick Stanger in South Jersey, and John Foster of upper New York State, are responsible for much of this desirable glassware we have called "Wistarberg." These men were all blowing glass in the first half of the nineteenth century.

What are the distinguishing characteristics of South Jersey technique? In the first place, examples are generally wide, capacious, and substantial of form, combining both utility and beauty—forms which suggest something of the forests of Thuringia and the expansive flow of the Rhine; which suggest the sturdiness of Amsterdam, yet hint at the delicacy of Venice, and the subtleties of the Manchu in their manner of manipulation. Warring and clashing characteristics the world over have somehow been fused in the great American melting-pot, and have emerged with an air of freedom from restraint and tradition. International in inheritance, these South Jersey types became our only truly national glass until the historical and pictorial flask and plate appeared upon the market.[1] There is a free sweep of line, a boldness of execution, yet withal a delicacy of wave and curve, of finial and handle, which stamp it as our own. The mid-Western factories, combining several of these forms or manners with several of the Stiegel forms and decorative methods, also evolved a peculiarly national glass. But it lacks the outstanding characteristics of both prototypes.

Despite its bulbous body, South Jersey type glass is never top-heavy; plain, crimped, and uneven of foot, its base remains sturdy; ample of mouth, its pitchers pour without dripping; the handles are made for hands, not for two fingers. The ware was equally satisfying

[1] With very rare exceptions, there is a German, Dutch, Italian, or English prototype for every piece of glass Stiegel made.

to the Quaker and to the more effete Philadelphian. A vase or a pitcher may combine bulbous form, crimped foot and handle, plastically applied threads about the neck, and superimposed decoration about the body, yet strange to say not seem over-elaborated. Only true artisans could achieve this effect of balance and symmetry.

Outstanding methods of decoration found in South Jersey type glass are:

1 Superimposed glass decoration: After the body of the piece had been formed it was dipped into molten glass of the same color, usually to about one third the height of the body of the piece. While malleable, the upper part of this coating, which varied in thickness on different pieces, was dexterously fashioned and tooled, drawn or dragged out by pincers into wave-like, lily-pad, or similar flowing designs about the body of the piece. Forms decorated in this manner were usually bowls, pitchers, and vases, and occasionally salts.

2 Plastically applied threads of molten glass were wound about the necks of pitchers, vases, and bottles, and occasionally around the dome of a sugar-bowl or sweetmeat-bowl top, being at times drawn out to considerable length and fineness while in a ductile state. These threads were frequently of a contrasting color to the body of the piece, brown, rose, or red-colored threads being employed upon light-green glass, or in various other color combinations. Sometimes, though rarely, one finds a specimen upon which these threads have been drawn out into loopings, bends, or drapes, or zigzagged about the article by means of the little pincers.

3 Crimping: Indentations, of a more or less fanciful character, were adroitly impressed upon the lower end

of the handle or the foot of a piece of glass; a handle occasionally being finished with a series of from five to seven little crimpings before the end of glass, where it is attached to the body of the piece, is turned up upon itself or drawn out into a point. These crimpings resemble the edges of our grandmother's pie-crusts; and a little metal wheel attached to a wooden handle, similar to those used in the early part of the nineteenth century to form the decorations on pie-crust, may have been used by the glass-blower. One seldom sees two crimped bases or feet exactly alike.

4 Blobs, prunts, or seals of hot plastic glass were at times applied to the formed utensil as a method of elaboration. Sugar-bowls, sweetmeat-jars, standing cups, and salts are found ornamented in such manner, but the examples are rare. These prunts were usually of contrasting color—blue upon an amber body, or blue and brown upon a clear white body; they were finished in a free-hand manner of decoration similar to a seal or crimping, and were broken off and rubbed down or drawn out into little points. This method was copied from one form of Dutch and Spanish decoration, very popular in the latter part of the eighteenth century.

5 Striated or whorled forms of decoration, in which bicolors and tricolors were used, and alternating clear and opaque glass employed, became popular in the early nineteenth century in New Jersey. The pitcher and the delicate sea-horse scent-bottles are the chief exponents of this form. The body of the piece is composed of alternating waves or loopings of these contrasting shades, giving a somewhat bizarre effect, to the examples.

It is believed that few colors were employed at the Wistar works. The first colors used in South Jersey

glass were a smoky brown and a dull sea-green, a darkish amber and a dull but lovely blue; but no one can arbitrarily set even the decade in which any of these were introduced. The ambers and blues gradually became more clear in tone; emerald-green, rose, and red were employed; peacock and robin's-egg blues were occasionally used; yet nobody knows just when.

The leading bicolor combinations found in South Jersey glass are as follows:

rose and light green
red and light green
brown and light green
rose and clear glass
red and clear glass
brown and clear glass
robin's-egg blue and clear glass
rose and opaque white
red and opaque white
brown and opaque white
robin's-egg blue and opaque white
golden amber and various shades of green
smoky brown and various shades of green
clear glass and opaque white
clear glass and light green

Among the tricolor combinations are the following:

brown, clear white, and opaque white
brown, amber, and opaque white
rose, clear white, and opaque white
robin's-egg blue, clear white, and opaque white
robin's-egg blue, brown, and golden opalescent
rose, green, and clear glass
rose, blue, and clear glass

Richard Wistar advertised that he made "Flasks; Demijohns; Pickle, sweet-meat and preserve-jars;

Mustard-pots; Spice jars; Measures; Snuff cannisters; Medicine phials; Tubes, globes, labratory equipment and apothecaries supplies." It will be noticed that he makes no mention of bowls, pitchers, candlesticks, tumblers, wines, decanters, vases, or salt-cups. Early South Jersey glass, however, included mortars and pestles; standing cups; vases with and without handles; mugs, bowls, pans, and pitchers of all sizes; wine-bottles, wines, hollow balls of various kinds, salt-cups, gimmal flasks, and at a somewhat later period great numbers of paper-weights and similar fanciful ware; canes, stocking-darners, glass fruit, scent-bottles, perfumes, Christmas-tree decorations, buttons, and other articles.

CHAPTER XIV

THE LEE AND THE BRAINTREE-QUINCY ENDEAVORS

There is a lapse of more than a century between the earliest attempt at glass-making in Salem and what is supposed to be the next colonial experiment of this sort in the province of Massachusetts. While the work of the promoters in this second effort met with little success, the recital of their trials is not without interest in the annals of American glass-making, giving us an insight into the difficulties which beset the path of the early manufacturer.

Joseph Crellins left Franconia in 1745, during the great exodus of the German Palatinates, arriving in Philadelphia without funds but with an education which enabled him at once to begin teaching foreign languages to the young Philadelphians. Forming a warm friendship with Benjamin Franklin, he entered into literary work in a small way, and three years later went to Boston. Soon after reaching that city he formed an organization of prominent citizens for the erection of what they thought would be a very much needed glass-works, the glass-industry in New England being then at a standstill.

Men were found eager for the venture to combat the flow of glassware coming into the country from foreign houses. Negotiations with the colonial governor and the General Court of Massachusetts were opened, with reference to the importing of labor from Ger-

many. The court took the matter under advisement, appointing a committee to look into the matter of these "German Protestants"; and on January 3, 1748, it handed down a favorable decision.

When the company organized by Crellins to promote the Berkshire factory had a survey made in connection with their grant, they selected the then unappropriated land between the minister's grant and what was known as "the Hoplands." They were not at all backward in their attitude, asking that the plot surveyed should include sixty-four more acres than the fifteen hundred already voted them. James Bowdoin of Boston, said to have been interested in the enterprise, and owner (between 1748 and 1755) of one sixth of the upper Housatonic township, petitioned the Town Council of Boston for "land and wood on which to establish and keep in fuel" a glass-works.

During this period the Crellins company bought the Indian title to the land. It is not known if buildings were erected before the expiration of the agreement regarding the "German Protestants" left the contract null and void.

Crellins was unable to secure the German workmen within the allotted time, and his project for the erection of glass-works in the towns of Lee and Williamstown, Massachusetts, failed. A number of the Palatinates, however, reached Boston, and although too late to come within the specified time of the court's privilege regarding the proposed Berkshire works, some of them later found employment at Braintree.

Crellins was not discouraged. In 1750 he interested a group of well-known Bostonians and one Philadelphian in the promotion of another manufactory. Among the Bostonians were Norton Quincy, a mer-

chant of prominence, and Peter Etter (or Etten), a rich stocking-weaver and friend of John Adams. They leased "100 acres of land at 10 shillings per acre per year," from Colonel John Quincy, a relative of Norton Quincy. The land was known locally as Shed's Neck, and lay on the outskirts of the town of Quincy. The acreage was named Germantown, in anticipation of the German glass-blowers, and was platted in squares called Berne, Zurich, Hanover, Manheim, and The Hague. Ornamental trees and shrubs were planted, in order that the proposed model village might take on the aspect of the fatherland. It was to be a pretentious place. But these idealisms cost money. After a small pot-house and a furnace had been constructed, scarcely a melt of glass had been run before the promoters faced bankruptcy in the undertaking, and had to sell out.

Joseph Palmer, a man of education, ability, and means, born in Devonshire, England, in 1716, arrived in America in 1746. In 1752 he negotiated with Crellins, Etter, and their associates for the lease of the defunct glass-enterprise. Richard Cranch, a twenty-year-old brother-in-law of Palmer's, also became interested in the project. Like their predecessors, they had no practical glass-manufacturing experience. On August 27 of this year the original company re-leased the property to them with the understanding that work was to start at once in the small furnace, and that additional building operations would begin immediately. Palmer also purchased a good-sized farm close to the property.

In the meantime some of the German glass-workers who had been sent for by Peter Etter arrived in Boston, sick and in an impoverished condition. To relieve their plight, the General Court issued an order on

January 1, 1752, requesting the commissary department of the province to supply Mr. Peter Etter with beds and blankets for the "poor, suffering Politines," and if there was not a sufficient supply the commissary was ordered to purchase the required number. A week later, Etter, interpreter for the Germans and also for certain French Protestant immigrants who had come over at the same time, informed the Government that twelve of these families had concluded an agreement to work for Palmer and Cranch at Braintree.

During the spring and summer of 1752, Joseph Palmer and his brother-in-law entered into extensive improvements and expansion of their Quincy-Braintree holdings, creating the first localized general manufacturing attempt in America. Building operations began in earnest. In addition to a new pot-house and furnace room for the glass-bottle works, a spermaceti works, a pottery, a chocolate-mill, a stocking-weaving shop, and a salt-works for the making of common salt, medicinal salts, and saltpeter, were erected.

Great interest was aroused by this wholesale construction. Crowds came from Boston, as well as from neighboring towns, to view the novelty. The glass-house aroused the greatest speculation, the excited spectators having heard tales to the effect that Spanish and German glass-furnace tenders tossed live puppy-dogs into the raging fire at certain periods of the moon's changes, in order to cause the metal to mix more perfectly. But the immolation of the little dogs failed to take place. The bricklayers and carpenters were bothered to death by these curious ones. The company finally lost patience, and caused the following notice to be printed in the "Boston Gazette" for September 4, 1753:

Notice is hereby given, that for the future none will be admitted to see the new manufactory at Germantown, unless they pay at least one shilling lawful money; and they are desired not to ask above three or four questions, and not to be offended if they have not a satisfactory answer to any of them.

In the late autumn of 1752, Palmer and Cranch began to feel the need of monetary aid. Isaac C. Winslow memorialized the colonial legislature to grant a patent to the company for a certain unstated term of years, for the reason of their having been at such a great expense, totaling hundreds of pounds sterling, in the erection of Germantown. It was set forth by Winslow that at least £2000 more would have to be expended before any advantages could accrue from the bottle-making. The patent, granting exclusive right to the manufacture of glass in Massachusetts, was accordingly granted them. But this did not relieve the situation. After the bottles were blown, a market could not be found for them. Inexplicable as it may appear, nobody seemed to want the wares of this idealistic undertaking. At a time when production was rapidly slowing down on this account, a destructive fire broke out, wiping away a part of the fine new factories and mills. The hopes of Joseph Palmer turned to ashes.

But the man's courage soon returned. On April 2, 1756, he implored the legislature to assist in the establishment of a lottery as an aid to the welfare of the community. And now comes one of the strangest incidents in the history of Massachusetts. The legislative body passed a bill legalizing the lottery on February 12, 1757, after the council had voted to dismiss the petition on January 25 of the same year. For good measure, they were offered the use of the Hall of

Representatives as a place in which the lottery drawings might be held! Unfortunately, matters were too involved for relief, and the glass-house closed down. We know next to nothing regarding its output.

Joseph Palmer did not allow financial failure to dampen his spirits or his patriotism. He became a general in the American Revolution, acquitting himself with distinction.

CHAPTER XV

THE BAMPER-BAYARD UNDERTAKINGS

"Two glass-houses in operation" are recorded in the 1732 census of the City of New York. De Witt's "Farm Map of New York," published about that date, indicates a factory called "Glass-House Farm" on land owned by Sir Peter Warren. The property faced the North, or Hudson, River, and the "Farm" consisted of more than thirty acres. The works may have been owned or managed by one of the Melyer family of glassmen, but nothing authentic has been found in confirmation of this supposition. It is logical to suppose that the old glass-houses situated adjacent to Hanover Square in the seventeenth century would have been razed for more valuable property use by the eighteenth century, and the idea that one of these glass-makers moved several miles up the island seems plausible.

In my search for data connected with these eighteenth-century houses, I find a void until the year 1752, at which time a group of enterprising New Yorkers decided to attempt to stem the flow of European glass into the provinces, and to avoid the resulting taxation, by making glass themselves. Caspar Wistar had just died, but his son Richard was making a success of the business in South Jersey, and the time seemed propitious for further American glass-production.

The Glass-House Company of New York was formed to "erect and operate" glass-houses. It was com-

posed of Matthew Earnest, Samuel Bayard—Lodewÿck Bamper, and Christian Hertell. While Earnest seems to have been the promoter and active manager of the Manhattan factory, the picturesque Bamper occupies the larger part of the stage.

Mr. A. J. Wall, in the October, 1926, issue of the New York Historical Society Bulletin, contributes a paper on the agreement of this company with one Johan Martin Greiner of Saxe-Weimar, Germany. I had the privilege of seeing the original document, which is in splendidly preserved condition. It is undated and unsigned, with Bamper's name misspelled "Bemper" by some careless clerk. It stipulates, on Greiner's part, that on the first day of February, 1752, or at such time as Matthew Earnest or any of his associates shall think proper, he will embark from Rotterdam for New York, and on his arrival there "shall & will Instruct & Inform in Ev'ry respect the aforemention'd M. Earnest or any of his Co-partners in the Art & Mistery of Erecting & Building a Glass House & allso in Blowing & Making of Glass." On the company's part, the principal stipulation is as follows:

> After the aforementioned Glass house is Compleated and a beginning is made in blowing of Glass We then oblige ourselves to pay for every hundred Quart Bottles which the aforesaid J. M. Greiner shall deliver us twenty four styvers hollands money and for every hundred half gallon flasks 3 Gilders Hollands Mony & in proportion for all other Glass delivered us and at the Expiration of one month after the commencement of their blowing & delivering Glass the aforesaid J. M. Griener shall Provide himself with Victuals & drink and be paid for his Labor as aforesaid together with a proper dwelling house with a Garden & Land for makeing of Hay as aforesaid.

The complete document, a most illuminating contribution to the history of our native glass-industry, is reprinted in Mr. Wall's article above referred to. No trace of Johan Martin Greiner's name has so far been found in other contemporary records, and it is not known whether he ever came to this country or not.

In 1752 the copartners bought the old works and the ground on which it stood, and erected more up-to-date buildings on the tract, which would now be bounded by Thirty-fourth and Fourtieth streets on the south and north, and by Eighth and Eleventh avenues on the east and west. It later became one of the most valuable parcels of land in New York city. As was the custom, a general store was built adjacent to the factory, where produce could be bought by the employees and the glassware itself sold to customers. The storekeeper was an enterprising and ingenious character named Thomas Lepper, a well-known innkeeper who ran a "Gentleman's Ordinary" called "The Sign of the Duke of Cumberland," which stood near the Ferry House on Staten Island. At this "place of good entertainment" Lepper quite frankly catered to an exclusive clientele. He seems to have been connected with various other highly interesting endeavors. The bar of his inn afforded an excellent outlet for the bottles and flips made at the glass-house, his tables no doubt advertising the ware. Conversely, Lepper used the general store as a place of interest to which to take his guests, at so much per round trip. He developed "New Found Land," as the place was called, into a resort, operating sight-seeing stages "four miles into the country," where one could find this "road-house with genteel appartments to ladies and gentlemen who desired to take the benefit of the country air."

Two years after this glass-works was started, "The New York Gazette, or the Weekly Post-Boy" of October 7, 1754, printed the following advertisement:

Notice is Hereby Given, That there is to be sold by Thomas Lepper, Store-Keeper to the Glass House Company, living at their store on the late Sir Peter Warren's Dock, at the North River, near Mr. Peter Mesiers, all sorts of Bottles from 1 Quart to 3 Gallons and upwards as also a Variety of other Glass Ware too tedious to mention, all at reasonable rates; and all Gentlemen that wants Bottles of any size with their Names on them, or any Chymical Glasses, or any other sort of Glass Ware, may by applying to said Lepper, have them with all Expedition.

N. B. Said Lepper Gives ready Money for ashes and old Window Glass.

On February 8, 1757, the Common Council of the City of New York granted Matthew Earnest permission to erect a dock or pier of about thirty feet on the "Water Lot" (or "Out Lot") belonging to the city, fronting his property called "New Found Land," next to the land of the late Sir Peter Warren, the rental to be one peppercorn a year for twenty-one years. It was considered that after that space of time the lot would be of no use to the city. On October 30, 1758, Earnest states in the "New York Mercury,"

that the newly erected Glass house at Newfoundland . . . is now at work and that any Gentleman may be supplied with Bottles, Flasks, or any sort of Glass agreeable to Directions. . . . N. B. Any person that has Oak Wood to dispose of by bringing to the above mentioned place will receive the New York Price upon Delivery, by

Matthew Earnest.

Ten years elapsed, during which much glass was made, although we know next to nothing about it.

Then from a letter written on January 12, 1767, by Governor Henry More of New York to the Lords of Trade in England, we learn that the glass-house has failed:

> The Master of a Glass-house; which was set up here a few years ago, now a Bankrupt, assured me that his ruin was owing to no other cause than being deserted in this manner by his servants, which he had imported at a great expense; and that many others had suffered and been reduced as he was, by the same kind of misfortune.

Almost a year and a half later the "New York Gazette" publishes the following item:

> John Taylor, late of Cow-Foot Hill, in the City of New York, upholsterer, but now of the Glass House at Newfoundland, in the Out Ward of the Said City, announces that he intends to carry on the business of the Tavern, and place of Public Entertainment at the Glass House and requests the patronage of the Ladies and Gentlemen who were pleased to encourage him in his former occupation.

By early August, Taylor had procured a "Commodious Stage Wagon for the convenience of patrons." It was scheduled to leave the house of Mr. Vandenberg, Stable Keeper to the Fields, near St. Paul's, at three o'clock each afternoon and return "immediately after the Sun setts." Salt-water bathing was one of the advertised attractions.

In 1767 the Glass-House Farm and "Newfoundland" were offered at public "vendue" to the highest bidder at the Merchants' Coffee House, the company's funds being exhausted. The next year, 1768, "The New York Gazette and Weekly Advertiser" carried

this notice: "To Let or Lease, about 35 acres, excellent site for a milk-man. Inquire A. L. Stewart, 235 Bway." It is said that after the Revolution the property was owned for a time by Rem Rapelje. Concerning actual operations at the defunct glass-house, only the following line has been discovered: "The ashes were converted in potash, and the broken window-glass used as cullet."

Samuel Bayard, Lodewÿck Bamper, Matthew Earnest, and Christian Hertell, the copartners operating Glass-House Farm, or "Newfoundland," were not content in undertaking the erection of but one glass-factory. Simultaneously with their plans for the building of the Manhattan works, they negotiated for property in Orange and Ulster counties, New York, upon which, we judge, they built a good-sized glass-house. The situation was beautiful, with Storm King Mountain towering majestically above it.

The residents of New Windsor agreed to sell twelve large lots to Samuel Bayard & Company for this purpose on condition that the land revert to the original owners in the event of the failure of the undertaking. The deed for the property, recorded at the Registrar's Office in New York, August 18, 1752, conveyed 10,360 acres of land in the two above-mentioned counties to "Samuel Bayard, Lodewÿck Bamper and Matthew Earnest, shop-keepers of New York and Chris Hertall, a mariner, for the consideration of £320 Sterling." The agreement between the citizens of New Windsor and the copartners of the proposed glass-works has been printed in the records of the Historical Society of Newburgh and the Highlands

I have found no word of explanation as to why

the company should have purchased this large acreage up the Hudson and attempted to manufacture glass on the site, thus assuming the responsibilities of two manufactories at the same time. The land was probably bought primarily on account of its timber, with the idea of furnishing fuel for the factory farther down the river on Manhattan Island. Having abundant fuel for two houses, the promoters naturally reasoned that it would be advantageous to build a works upon the spot, where they may have blown only cylinder-glass or bottles, or both. Christian Hertell became the manager of the New Windsor works, Earnest taking charge of Glass-House Farm.

It is plausible to assume that foreign workmen were imported for the purpose of teaching the art of glass-making to the native employees. A letter undoubtedly alluding to these works states that they had "five Skilfull workmen brought from Holland." Further research may reveal the interesting fact that flint-glass, of a quality equal to some of that turned out at Stiegel's, was blown by these Dutch glass-blowers at one or both of the Bayard-Bamper houses. Would either Bayard or Bamper (leading citizens of New York, and men of large experience, wealth, and travel) have been content to turn out only the coarser and commoner kinds of glass, while the province of Pennsylvania was producing emerald-green and cobalt-blue salt-cups and sugar-bowls? I do not think so.

The New Windsor works probably operated until 1785, although business lagged after the beginning of the Revolution. By the close of hostilities, the company was bankrupt. The buildings probably were never again used for glass-making.

Bayard and Bamper took orders for the output of both factories at their large New York shops, where they conducted both an export and an import business. Bamper handled such staple imports as molasses by the hogshead (which was converted by the enterprising citizens into rum), brown sugar, snuff, cordage, spices, dried fruits, and many luxuries such as linens, silks, tea, pewter, Holland "chiney-ware," and slip-decorated pottery. Each merchant sold his glassware over the counter.

Several crude bottles, heavy and squat, which have been unearthed on Long Island or near Newburgh, have been attributed to Glass-House Farm. They are very like those made at our other early houses and those brought over from Europe at this period. Dates imprinted on these bottles fall within the period of the Bayard-Bamper operations, but it is hoped that a piece of tableware may some day be authenticated beyond question as being of their make. It is rather late to expect this, yet stranger things have happened. The output must have been large, and considerable glass about which we are now uncertain and hesitant is probably Bayard-Bamper.

In the career and personality of Lodewÿck Bamper, one of the copartners in the enterprises described above, the biographer and the novelist would find rich material. Here was a character as unusual and interesting as Robert Hewes, Henry William Stiegel, or James O'Hara, three of our other early glass heroes. In his youth Bamper married Margita Brouwer, daughter of a one-time Governor of Surinam, Dutch Guiana. Having amassed great wealth in Holland in the mercantile and shipping business, Bamper decided at middle age

to set out for the New World and live the life of a retired gentleman in the growing little city of New York. Accordingly, sometime between 1720 and 1730, he set sail on his own vessel, with only his personal and family possessions as cargo. The crew of the vessel, following the Dutch custom of that day, was comprised of slaves from Africa; and the Bamper household servants included four females of the black race, bearing the names of "Europe," "Asia," "Africa," and "America." (Had there been a fifth, she would undoubtedly have been called "Australasia.")

When the ship at last reached port, all New York marveled at the variety and magnificence of the cargo that had been stored within her hold. In addition to sixty thousand guineas, Bamper brought over with him an enormous amount of silver plate, some gold plate, paintings and tapestries, beautiful needlework, jewels mounted and unmounted, exquisite laces from Spain and Italy, silks from France, linens from Holland, pottery and porcelain from Holland and China, fabrics for hangings and costumes, cottons from the Orient, stuffs from India, carpets from Persia—the list is astounding! The silver alone included two complete table-services, also tureens, salvers, goblets, mugs and cups, ladles, porringers, chafing-dishes, urns, spoons, bowls, pitchers, and trays. It is said that the New World had never before seen such linens. There were also fine mares and stallions for breeding purposes, peacocks and parrakeets, a pet calf, and a varied assortment of other animals and birds. There were bulbs, shrubs, and trees for a wondrous garden; tulips from the homeland, rare plants from the tropics. And there was a fine pipe-organ with large pewter pipes.

Soon after arriving in New York, Bamper bought

several pieces of land, among them a parcel at the corner of Beekman and Gold streets. Here he erected a brick house of fifty feet frontage, "in the best manner of the day," and laid out gardens in the rear extending to Ferry Street. He also bought a two-story frame dwelling in South Clark Street, and soon made heavy purchases of land in "the western part of the province of New York"—although this latter may refer to his share in the Orange and Ulster counties glass-house venture.

In due course the Bamper household was installed in the dwelling at the corner of Beekman and Gold streets. The pipe-organ, a great curiosity in those days, was placed at one end of the long dining-room; and while Lodewÿck, his family, and perhaps his friends, were gathered about the board, a valet-musician played on it the finest compositions of the time. The rooms were beamed and partly paneled, with exotic carvings from Bamper's own designs cut into the beams, mantels, and paneling. A head gardener from Holland accomplished wonderful things in the garden. This was a paradise of flowers, shrubs, fruits, and birds. Nor were these all. About the walks, or partly hidden by the foliage, life-sized figures carved from wood, then painted and gilded, of grenadiers in full uniform, with here and there their wives or children, met one at every turn. What a pity that nothing of all this has survived—that we have no remnant of these carvings, these statues, this man's glass!

After the house was dismantled, in later years, the organ was given to the Lutheran Church which stood at the corner of William and Frankfort streets in New York. In 1842 the organ was still in use, after a century of service.

Although he came to America to retire, Bamper found active life in the New World too interesting and his disposition was too restless to permit him to carry out this purpose. So he went into trade and manufacturing; he opened shops; he sent his ships hither and thither to bring back raisins, rosin, tea-kettles, twine, writing-paper, cinnamon, ivory, and peacocks. After the establishment of the glass-manufacturing houses with which he was associated, he opened another shop solely for the sale of the glass produced at these houses, acting as general commission merchant for its sale. Had the output been only bottles or window-glass, is it probable that Bamper, the wealthy and artistic connoisseur, would thus have interested himself in the retail and wholesale handling of such products? This leads us to speculate as to whether the Bamper-Bayard firm, rather than Stiegel, might have been the first in America to put out enameled mugs and engraved flips, to use pattern-molds for expanded pieces; to employ threads plastically applied about the tops of pitchers, to make superimposed types with wave or lily-pad decoration such as we now designate "South Jersey technique." We read that five or fifteen "skilled imported workmen" were employed by these Manhattan glassmen.

If we but knew the contents of Lodewÿck Bamper's little eighteenth-century glass-shop in New York, our knowledge of early American glass would be greatly augmented and many of our present-day generalizations might be revolutionized. We know a little about his carvings, his organ, his servants, his wooden grenadiers, his silver, and his stallions; perhaps some time we shall know something about his glass.

CHAPTER XVI

STIEGEL AND THE MANHEIM INDUSTRY

HERE and there in the pages of our early annals appear the figures of certain eccentric characters who played prominent parts in various fields—men with a touch of the grandiose and the bizarre in their make-up, who developed a picturesque philosophy all their own. With an air of the Old World, their birthplace, yet peculiarly of the New, these so-called lords, barons, and kings in American history have left us far richer in lore and literature than if they had not built themselves extraordinary mansions and palaces embellished with unique statues, fine organs, enormous polychrome coats of arms, peacocks, and pulpits. Had the monarchical tradition been less strongly intrenched in their breasts, they would now be less secure of immortality. Happy, indeed, would have been the hearts of these men had they dreamed of the pages of print which would be written about them. By some strange freak of fate, three or four of these interesting characters became early American glass-makers. Our "Baron" Stiegel has left us a glass-heritage which in pure tonal beauty and sheer exquisiteness has seldom been equaled and never surpassed.

The eldest of six children of John Frederick and Dorothea Elizabeth Stiegel, Heinrich Wilhelm Stiegel was born in Cologne, Germany, on May 13, 1729. The father died in the boy's youth; and not long after, with his mother and a younger brother

named Anthony, Heinrich set out for the New World, sailing from Rotterdam, Holland, on the ship *Nancy*, with two hundred and seventy fellow-passengers.

From the time when Queen Anne had first assisted the refugee Palatinates to reach her provinces overseas, there had been a continuous exodus of Germans from the Rhine Valley to America. Thousands of them died from fevers, plagues, and exposure, but the hardier survivors soon established themselves in the New World, becoming its most successful agriculturists. On account of the productive soil in that province, many of them settled in Pennsylvania, naming their new settlements after the Old-World towns from which they had come.

The *Nancy* reached Philadelphia on August 3, 1750, docking at the old Samuel McCall wharf. After a stay of a year or two in Philadelphia, concerning which we know next to nothing, the Stiegel family moved to Lancaster County, Pennsylvania. On November 7, 1752, Heinrich was united in marriage to Elizabeth, the rosy-cheeked daughter of Jacob and Magdalena Huber, and became an assistant at Elizabeth Furnace, the pretentious iron-works owned by Jacob Huber.

Four years after Stiegel's union with Elizabeth Huber, a bookkeeping system was inaugurated at the iron-works, the first entry bearing the date September 22, 1756. These accounts give evidence that the forge was being run on a coöperative basis, the partners then being Charles Stedman and Heinrich Stiegel. Charles Stedman and his brother Alexander, who, presumably, bought an interest in the business after Jacob Huber's death, were formerly residents of Philadelphia.

On April 10, 1760, Heinrich Wilhelm Stiegel became a naturalized citizen, officially changing his given names to "Henry William." He was already taking a

lively interest in the secular and religious affairs of the community. Believing thoroughly in education, he exerted his influence in behalf of the children in the neighborhood of Elizabeth Furnace, even going so far as to pay the salary of the local schoolmaster when it was not forthcoming from other sources. He was also a man of deep-rooted evangelical faith, a Lutheran who never neglected his church. Friend of the great Henry Melchior Muhlenberg, who came to Pennsylvania in 1742 and preached at the various little churches in southeastern Pennsylvania, Stiegel kept in close touch with this patriarch of Lutheranism in America, and was appointed lay delegate to the Lutheran Ministerium of Pennsylvania and adjacent provinces, which met at the Brickerville Church.

Stiegel's first efforts at glass-blowing were not at Manheim, as many suppose, but at Elizabeth Furnace, where glass-ovens were built in 1762. The first firing took place on September 18, 1763. Green bottles, ranging from pint to gallon sizes, and window-glass comprised the output, although it is believed that other glassware for domestic use was turned out in small quantity. The blowers were Martin Greiner, Christian Nazel, and Benjamin Misky. Anthony Stiegel, now a young man, acted as supervisor of the works. The production was sold, in the main, to the neighboring towns of Lancaster, Reading, and York, and in the smaller communities. Several other experienced glassmen found employment at the factory—Daniel McDaniel, Michael Greisbach, Matthias Hoffert, Anton Walden, George Glass, and Michael Miller. When the Manheim furnace got under way, these men went to the new location, the Elizabeth Furnace production of glass being discontinued.

Stiegel and Manheim Industry

After the experiments in glass-making at Elizabeth Furnace had been satisfactorily demonstrated, Stiegel purchased a four-hundred-acre tract of neighboring land, with the primary idea of using its timber for fuel. Later, independently of the Hubers and Stedmans, he acquired the iron-works at Charming Forge, near a beautifully situated village called Womelsdorf (Schaefferstown). At this time there were only two log cabins on the entire tract of land. In 1762 the Stedmans bought a tract of 729 acres ten miles north of Lancaster, on Chique-Salunga Creek, paying fifty pounds sterling as purchase price. This same year Stiegel took over a one-third undivided interest in the land. The ability of these men thus to increase their holdings was due to the highly successful operations at their iron-works, the output of which had exceeded their most sanguine expectations.

In the meantime, on February 3, 1758, Stiegel had lost his first wife, Elizabeth Huber, by whom he had had two daughters. It is interesting to note that not only was Stiegel's mother named Elizabeth, but his first wife and his furnace were called by this name, and eight months after the death of his first wife he married another Elizabeth. She was Elizabeth Holz, born in 1735 in Philadelphia, of German parentage.

Soon after it had been demonstrated that his glass-making experiments were successful, Stiegel drew £120 from the general fund of his business and sailed for Europe, to arrange for the securing of expert foreign workmen. He went to London and Bristol, where he studied every phase of the glass-business—quality, types, and quantity production, and the amounts exported to the foreign trade. Probably he hired his Venetian glass-blowers in London. Altogether, while

abroad, he drew on the Elizabeth treasury for £600—an extravagant amount in the opinion of his associates at home, but transportation of men and (in some instances) their families had to be arranged and paid for, besides his own expenses. Stiegel was absorbing glass-making as a dry sponge absorbs water, and those months in England formed the background for the most beautiful glass ever blown in the American colonies. The Venetians whom he engaged surreptitiously brought their molds and tools with them to this country, as did also, probably, the German and English workmen. We understand the wide range of Stiegel's types when we remember these various nationalities and their varied techniques.

In 1763 and 1764 Stiegel and the Stedmans had hired Thomas Lincoln to survey and lay out building and business lots on the large tract of land ten miles north of Lancaster which they had acquired in 1762. The idea of erecting a glass-works on this acreage had evidently been brewing in their minds for some time. The community to be established here was designated Manheim, after the German city of that name; and here construction of the Manheim glass-works was begun on October 6, 1764. When the new furnaces were ready to fire, and the foreign workers had arrived, many of the newly laid out lots were sold and little homes built. A self-sustaining community was shortly under way. Whereas but ten glassmen had been on the payroll at Elizabeth, one hundred and thirty-three hands were soon busily working at Manheim at the various tasks incidental to glass-making, and this number, it is said, did not include the enamelers, the cutters, or the "flowerers."

In Ledger A, No. I, we find this entry under date of

October 29, 1765: "This day the glass ovens being finished, the fire was put in." And on November 11, 1765: "This day in the afternoon the glass makers began to work. George Ege and Philip Wiseland were the first customers, Ege paying 5 shillings 6 pence for 1 doz. pocket bottles, and Wiseland 5 pence for 1 pocket bottle." On February 23, 1766, the pastor from York bought two cream-jugs and one sugar for three shillings. On April 14, 1766, it is recorded that "this evening the glass house ended the season, the workmen being worn out." [1]

Stiegel eventually had shops in various trade centers where his glass could be wholesaled to the trade and retailed to the individual customer. Agencies were established in York, Lancaster, Hanover, Reading, Lebanon, Carlisle, Heidelberg, Brickerville, Elizabethtown, Middletown, Hagerstown, and Ephrata; while later, distributing agencies in New York and Philadelphia, and two each in Boston and Baltimore, were handling this popular American glassware. As it became the fashion, New York had five merchants selling Manheim glass. Every household of pretensions aimed at displaying Stiegel mugs, bowls, flips, salts, and creamers, while the pocket scent-bottles or perfumes took Baltimore and Philadelphia by storm.

Several articles have appeared in print in which it is stated that Stiegel glass was decidedly localized in southeastern Pennsylvania. This is far from the truth. It was as common in Boston as Boston and Sandwich

[1] It was customary, on account of the severity of the work of a glass-furnace "teazer" and blower, to lay off from three to six months at a time, in order that the men might recuperate their health and strength. One must always take this fact into consideration in computing the output of an early factory. Many glass-blowers succumbed to heart trouble.

glass later became in Lancaster County, or as Pitkin carboys were in Bermuda, or E. Wormser flasks in Rio de Janeiro. Routes of trade, owing to certain conditions and demand, carried our glass to the least expected places. Local consumption frequently played only a small part in a good-sized glass-factory's output.

The wage scale at these early glass-houses seems to us to-day pitifully inadequate. A year's agreement was entered into between Martin Betz and Stiegel stipulating that Betz was to work in the glass-house "1 year at 1 pound per month. He is to have 10 lbs. of nails in bargain." [1] Another agreement specified that Andrew Holden was "to drive an Ox team for one year at 33 shillings and in bargain a pair of shoes." The ox team was doubtless used either to haul the timber to the furnaces or transport the finished product to Lancaster or York.

Business soon flourished at Manheim, and the community fairly hummed with industry. Thrift was practised by nearly every one in the town. The little houses were of shining spotlessness, the people dressed simply, ate wholesome food, attended their church meetings with regularity. But with this collective thrift and simplicity of the majority was contrasted one of the world's most conspicuous examples of extravagance. Like heady wine, prosperity went to the head of Henry William Stiegel. The man seemed obsessed, and he began to live on a scale before unheard or undreamed of in his community, or its vicinity. He caused three structures to be erected: a mansion at Manheim, completed in 1764 and situated at the corner of North

[1] Nails in colonial times were a great luxury, old clapboard and other frame houses frequently being burned down in order that the nails might be salvaged.

Prussian and East High streets; a castle and a fort near Womelsdorf; and a castle or tower about five miles northwest of Ephrata.

The mansion was built of the finest imported English brick, which was hauled to Manheim from the docks at Philadelphia by Stiegel's ox-team. Nearly everything in this home was imported. Tapestries, which are fortunately still preserved at Manheim, hung from the walls; the choice piano may now be seen in one of the rooms at Independence Hall in Philadelphia. Upon the second floor a large room was set apart for religious services, and a pulpit installed, from which Stiegel expounded the Gospel to his friends. He and his companions danced, drank fine wines, sang, and prayed. A band of musicians played for them—musicians who were also the glass-blowers, and who at times were obliged to drop their work at the furnace, hurriedly get into uniform, and rush for their musical instruments. Perhaps a blue sugar-bowl or an enameled mug was but half completed—that made no difference.

Womelsdorf had been originally settled by German Jews, who had a little synagogue in the village. Just outside this town, on a commanding hill on the Lancaster Road, Stiegel built his castle and fort. On the towers of these queer structures he placed cannon—not in fear of enemy invasion but merely that a proper salute might be fired when he appeared at the place. The other tower or castle, near Ephrata, was similarly equipped with cannon. In gorgeous coach and four (or eight) the master, splendidly dressed, would approach, outriders giving notice of the coming of the equipage. Cannon announced his arrival, which was but the signal for a greater glory. Hastily washing the dirt and grime

from their hands and faces, his retainers and helpers would doff working-garb and don regalia, and the band would blare forth. It was veritable *opéra bouffe!*

Just how Stiegel came by the title "baron" is a mystery which will probably never be solved. Whether he assumed it, himself, or his fellow-citizens bestowed it upon him, we have no means of knowing. Attempts have been made to discover authority for the assertion, made in various articles on the man and his work, that he was of noble birth, but exhaustive research has failed to establish the point.

Stiegel's motives became fearfully mixed. The townspeople began to look askance at his "goings-on." Such pomp and trappings were incompatible with American ways. But this queer man never lost sight of the fact that his mission in life was to give America the most beautiful lead flint-glass she had yet known—glass as lovely, as clear, as resonant, as colorful, as perfectly cut, engraved, and enameled as any which was being imported from Bohemia, Germany, Holland, or England.

Business at the glass-works continued brisk until the spring of 1767. From that time on until the summer of 1769 a great cloud of depression enveloped the manufacturers, artisans, and merchants of the provinces. Men of means began to suffer heavy losses, while the taxes levied by king and parliament became a yoke about the necks of every one in trade. Men who had labored hard and long suddenly saw the results of their efforts vanishing, and were temporarily powerless to stem the tide. Of such things are revolutions bred.

Chaos soon reigned at Manheim. The master, caught up in a mental vortex, committed even stranger acts than before. He was at heart a super-patriot, but now

he was accused of Toryism, because he had adopted the splendors of an Elector of Hanover or Hesse. Stiegel became bombastic, then later, by degrees, pathetic and very humble.

The Stedmans also had been affected by the general collapse of business. Suddenly land-poor, they were obliged to mortgage their interests in Manheim village for £2700. Stiegel's false pride prevented him from doing likewise. The relations between him and his old friends the Stedmans became strained. One cannot blame the latter, for in spite of the hard times and the canceled orders of commission merchants, Stiegel became possessed with the idea of building another glass-house. The Stedmans, attempting to dissuade him, ended by quarreling, and a complete severance of their relations with him resulted. Advertising his holdings at Elizabeth Furnace and Charming Forge for sale at £8000, he contemplated investing this amount in the new buildings. No buyers came forward. Stiegel was finally driven to mortgage his Manheim lots and the two iron-works for a total sum of £3000.

The extensive plans for the new factory were nevertheless rapidly pushed forward. Work started April 20, 1769. Nearly one hundred idle men were given employment on the various buildings, and nearly every then known improvement for the making of glass was installed. Stiegel was fired with the laudable, if not practicable, ambition to give Americans the finest glass they had ever used. On July 5, 1769, he advertised in the "Pennsylvania Gazette and Weekly Advertiser":

AMERICAN GLASS WARE

Consisting of a very necessary, useful and curious variety of white and blue flint, manufactured at

MANHEIM GLASS WORKS

In Lancaster County, Pennsylvania,

to be sold by Brooks and Sharp, at the house of Nicholas Brooks in Front Street near Lombard Street, Philadelphia, where, merchants for exportation, retailers in Philadelphia, country storekeepers, etc., may be supplied with any quantity for cash or short credit and where all orders from the country shall be punctually complied with.

As the proprietors have been at immense expense in erecting said works, and engaging some of the most ingenious artists in said manufacture, which is now arrived at great perfection, and above all, as at this crisis it is the indispensable duty, as well as interest of every real well wisher of America, to promote and encourage manufactories among ourselves, they hope from the glorious spirit of patriotism at present voluntarily and virtuously existing here, to receive the approbation and encouragement of the public, which they expect to merit a continuance of, by selling their goods on much lower terms, than such imported from Europe are usually sold.

N. B. Those families who formerly sent orders to the works, which were not complied with, may be immediately supplied, by applying as above.

Somehow, Stiegel went on, dodging payments and judgments but blowing blue creamers, engraving flips, etching mugs, making mustard-pots and vinegar-cruets. He would make glass by hook or by crook—and it was now more frequently by crook. Maintaining a bold front, he made more beautiful "Daisy-in-the-Square" bottles, for which we are thankful. But he lost all business sense and developed a genuine monomania for glass-making.

In this year (1769) Isaac Cox foreclosed his mortgage on the Stedman lands. At the same time Stiegel induced Benezet, who held his mortgage, to release his

own Manheim interests from the blanket-mortgage on all his lands. This accomplished, he managed to purchase the Stedman interests from Cox for £3000, simultaneously mortgaging his own Manheim holdings to Cox for £2500, and his glass-works for £500. It was a manipulation worthy of the traditional Philadelphia lawyer, but it did not produce startling results. In 1771, Stiegel branched out in his advertising, the following being taken from the "New York Gazette and Weekly Advertiser":

AMERICAN FLINT GLASS

Is now being made at the factory in Manheim, in Lancaster County in the province of Pennsylvania, equal in quality with any imported from Europe where all merchants, store keepers and others may be supplied on very reasonable terms; and as the proprietors of these works well know the patriotic spirit of the Americans, he flatters himself they will encourage the manufactories of their own country and hopes to be favoured with their orders for Flint Glass and begs leave further, to assure them that whatever commands he may receive shall with great punctuality and dispatch be executed. Wholesale dealers may expect proper allowance or abatement on buying large quantities.

For several months the demand for his glass increased in both Boston and New York, and at this period Stiegel opened his own store-room in New York, which he personally managed a part of the time. In this year he advertised in the New York press:

AMERICAN FLINT GLASS

Henry William Stiegel

Proprietor of the first American Flint Glass Manufactory in Pennsylvania is just arrived in this city, and opened a ware-

house near the Exchange, the corner opposite to Mr. Waldrons where he hopes for the encouragement of those who wish well to the establishment of manufactories on this continent; and that the glass he offers to the public, will be found to rival that which is imported and sold at lower prices. Quart, pint, and half-pint decanters; pint crafts; double flint pint, half-pint and gill tumblers; syllabub and jelly glasses; three-feeted salts and creams; wine and water glasses; vinegar and mustard crewets; phials and other bottles for chemists and apothecaries.

As his stay in town will be short, he begs the favour of an early application to him from those, who want a supply of glassware.

Taken as a whole, 1772 was a good year, perhaps the best that Stiegel had ever had. It was during this second rise in fortune that he conveyed the now famous strip of land to the Zion Lutheran Church at Manheim. The deed reads as follows:

Deed from Henry William Stiegel and Elizabeth his wife, dated December 4, 1772, by Peter Ereman, Henry Whorley, and Wendell Harzell, trustees and wardens, to and for the only use, purpose and benefit of the German Lutheran Congregation conveying Lot No. 220 in Manheim, in consideration of five shillings, and they yielding and paying therefore unto the said Stiegel, his Heirs and assigns, at the town of Manheim, in the month of June yearly forever hereafter, the rent of One Red Rose, if the same shall lawfully be demanded.

Zion Evangelical Lutheran Church.

In 1772, Stiegel adopted the trade-name of the American Flint Glass Factory for his business. About this time, Alexander Bartram, an agent for Stiegel's glass, announces to the public that he has visited the Manheim works, where he has contracted for a com-

plete assortment of flint-glass, "consisting of quart, pint and half-pint decanters; pint, half-pint, gill and half-gill tumblers; wine glasses; vinegar glasses; salt cellars; cream-pots; sugar dishes with covers; jelly glasses; syllabub glasses; proof bottles, etc., etc., which are to be delivered to him at his house on Market Street, next door to the Indian King."

At the end of 1772, business took a sudden turn for the worse. Everything went awry. The lottery bee now entered Stiegel's bonnet. He advertised in the "Pennsylvania Journal" offering lottery tickets for sale, setting forth in glowing terms the advantages which would accrue to the lucky winners. But this gamble netted only £83. The first property to slip away from him was Charming Forge, which was sold at sheriff's sale in 1773. Foreclosure of the mortgages held by Cox and Benezet on the Manheim and Elizabeth Furnace properties was threatening, so that early in 1774 Stiegel was at the end of his resources. Although he had always been very considerate of his employees, his skilled workmen could not be paid and left the plant. Consequently the finer grades of glass were now superseded by the more ordinary types.

On February 3, 1774, the sheriff of Lancaster County, John Feree, sold the Manheim property to Michael Diffenderfer; thus the town passed out of the hands of its former owners. Stiegel's sole possession now was Elizabeth Furnace, which he retained only through the generosity of Benezet. Strange as it may seem, he imagined that conditions would rectify themselves. Having done so much to create and build up the town, he felt (perhaps justly) that the colonial legislature should have rendered him assistance. But this body, harassed by impending war, did nothing for

the man who had contributed so greatly to the esthetic and industrial life of the Province of Pennsylvania.

In May, 1774, all hands were laid off at the Manheim works, and the plant was virtually shut down. However, several of the workmen continued on at odd jobs intermittently for a few months. In November of the same year Stiegel became a victim of one of the most unjust laws on our colonial statute-books. He was cast into debtor's prison, and remained in confinement for over forty days. His pride was now crushed. A letter, preserved in the Danner collection, written by him to the authorities while he was imprisoned reads as follows:

> Sir: Please to take notice that I have appealed to the Honourable House of Assembly for a Law to relieve my person from imprisonment. If you have any objection please to attend Thursday next at three o'clock in the afternoon, at the Gaol in this city, before the committee of Grievances.
>
> Your Humble Servant
>
> Henry W. Stiegel.

On August 4, 1774, he wrote to Jasper Yates, his lawyer:

> Let them give me time and I will pay every dollar. Can it be that my former friends in Lancaster County will drive me to ruin when I have increased the wealth of the county by at least 1,500,000 pounds? I beg therefore you will take pity on an honest man that wants nothing but to satisfy everybody and maintain my cause. I could not send you a fee at present, money being too scarce, but shall satisfy you with honor and gratitude.

Only a few days after this supplication was penned, Mrs. Stiegel went to an old friend, John Dickinson, for aid, but nothing came of it.

On December 24, 1774, the General Assembly of Pennsylvania passed a special relief act for "a languishing prisoner in the gaol of Lancaster County." By the terms of the act which freed him from prison, Stiegel was compelled to turn over all of his possessions, excepting ten pounds of clothing and bedding. Gone were the tapestries, the porcelain, the coach, the horses, the hounds; gone the fine furniture, even the pulpit. But the crowning blow was yet to come: not one piece of his glass was he allowed to keep!

Stiegel and his wife, forced to give up their Manheim mansion, went to Elizabeth, where he lived in his former home as a caretaker. When Elizabeth Furnace was sold to Robert Coleman, in 1776, he received employment from the new master. The war started about this time and the foundry, receiving orders for cannon for the Continental Army, bent every effort on that output; but soon the scene of operations on the battle-front shifted, and orders were placed elsewhere. Elizabeth Furnace was hard hit. Stiegel, again without employment or money, moved into the parsonage of the Brickerville Church, and it is presumed that he made a meager living for the time being by instructing the young, the local schoolmaster being in the army. In 1780 he left the parsonage and was given a home in his old castle at Schaefferstown, now owned by his brother Anthony. A year later he left the castle for a house, also owned by Anthony Stiegel, at Schaefferstown, where he continued to teach school.

During his last residence at Shaefferstown, Stiegel's beloved mother passed away, and in 1782 his wife died. He went to Charming Forge, then owned by his nephew, George Ege; and here, on January 9, 1785, he received news that his "little brother

Anthony" had suddenly met death. Next day the weary and broken-hearted man was found dead in his bed. No monument marks his resting-place; indeed, it is not even certain just where he is buried. But should you ever be moved to visit Manheim on the day of the "Ceremony of the Payment of the Rose," find your way to the little Brickerville Church, and if you are a lover of Stiegel glass lay your tribute of one red rose upon the green grass of the churchyard.

CHAPTER XVII

THE STIEGEL OUTPUT

The flint-glass made at the Stiegel furnaces had a uniformly high structural tension, tending to brittleness and to resonance. It is believed that it was the first glassware in America to contain lead in its composition. The quality of the metal was so fine and the coloration so uniformly excellent and so well compounded that the glass possesses a vital appearance seldom seen in other glassware, either antique or modern. The bowls and pitchers glow with a brilliancy which has been one of the reasons for the preëminence of Stiegel glass in the American collection. The Italian, German, and English artisans who came to Manheim from European houses possessed a fine feeling for form, and for the delicate and beautiful in both molded and applied decoration, though the applied decoration of an article was considered of less importance than beauty of surface and form.

To the Rago brothers, Venetians, who without question brought their little pattern-molds, their tools, and a pure Venetian technique to Manheim, we owe many of the delightful pieces of glass which grace our collections; their "Venetian diamond" forms of molded decoration being a direct adaptation from the Murano models. Probably they were also responsible for the "Daisy-in-the-Square" amethystine, blue, and amber bottles, which are among the most sought-after specimens in the Stiegel category.

The German workmen were, on the other hand, probably the first to introduce the superimposed-body nursing-bottles, and also many of the forms blown at the Stiegel works without the use of the mold. The English artisans surely brought the technique of the British wine-glass with them and the art of making opaque glass, as practised in the Bristol factory. The enamelers were probably Swiss, not Bavarians or Germans. With this gathering of nationalities into the little Pennsylvania village, one of two things was bound to happen—a glass manifestation of great beauty and purity, or a hodgepodge. To the credit of Stiegel, the former resulted. Although we may find a Venetian swan gliding upon the top of a diamond-diapered sugar-bowl, a Swiss castle enameled upon a Rhine wine-glass, drinking-glasses of definite English character whose air-twist stems defy one to prove whether they be native or foreign, engraved canisters which might have come from Bavaria or the Low Countries, five or six-spouted water or wine carafes the duplicate in shape of those made in Spain, the forms and methods of manipulation never seem to clash. The swan, for instance, always glides on her proper lagoon; she is never on the Rhone or the Thames.

The domed and footed urns and bowls, the footed cream-jugs and salts, lopsided though they be, maintain a graceful outline. Vessels were fashioned for sweetmeats, brown sugar, rich cream, and precious salt, and were not formed as if intended for almost any other use, as was glassware after the decadent period had set in. We never find a wishy-washy blue, a murky amethyst, a cloudy amber in this glass. The metal-mixers and color-compounders were as efficient as the later John Foster, Christopher Muldoon, James Lyon,

or Thomas Leighton. The splendid quality of the Stiegel colorings is among our safeguards in differentiating this ware from the modern reproduction. The makers of spurious "Stiegel" in England, Belgium, Sweden, or Pennsylvania, cannot quite produce the true Stiegel cobalt blue or sapphire.[1]

Besides the pieces with plain surfaces, there was Stiegel glass ornamented by being blown into both pattern or part-sized molds and into full-sized molds, and etched, engraved, cut, enameled, and gilded decoration.

Etching and engraving became popular—on tumblers, flips, canisters, mugs, and other pieces. Cut specimens are not plentiful, but an occasional cut tall-stemmed wine-glass is found (the air-twist stem being attributed to Manheim from fragments unearthed by Dr. Hunter). A number of glasses accredited to Stiegel are doubtless of other manufacture, yet wines and tumblers were among his most prolific output. Gilding was employed, though rarely, in the form of delicate floral or geometrical decoration.

John Casey was one of the leading engravers; Lazarus Isaacs the chief glass-cutter, especially of flowers; and Henry Nissle, Joseph Welsh, Sebastian Witmer, and Joseph Yetters were the enamelers.

Enameled ware was first advertised in 1772, the colors employed in the work being Indian red, yellow, blue and green, and black and white. Black was used sparingly, and there was never a shading of color in the use of the enamels.

The same pieces were generally used for enamel-work as were used by the engraver—mugs of all sorts,

[1] Following the practice of our early glass-makers, I use the word "cobalt" in preference to "sapphire" throughout this book.

tumblers, canisters, and an occasional covered sweetmeat-jar. Children's playthings were often decorated with little touches of color.

Enamel upon glass was very popular in Germany, Bavaria, and Switzerland at this period; nearly every immigrant from those countries to the colonies brought an enameled canister or mug, a pewter plate, and a piece of slip-ware pottery with him in his sea-chest. Earlier enamel glass is therefore found in lower Pennsylvania than was made at the Manheim furnaces. The Stiegel workmen, and their sons who emigrated westward during the early years of the nineteenth century, also practised the art of enameling, the later decoration usually taking on a floral aspect, the mugs and tumblers developing into gift or friendship character. The red in these pieces lost its flame-like color, becoming more of a deep rose shade. Doves, parrots, roosters, dogs, cows, birds, castles, men, women, and children were artfully painted upon the body of the Stiegel examples.

It is said that Nissle executed doves, love-birds, floral designs, and a woman seated in a boat. Welsh excelled in floral bouquets and in doves; his work was the best balanced in the output of the four artisans, more sure of touch and more finely penciled, while he employed a circular line above the eye of his birds and an almost straight line below. Witmer was more crude, painting gaudy hearts, cows, and fantastic birds on stiff formalized branches; careless in execution, he splashed on the color, yet producing to the modern eye as agreeable an effect as the more meticulous Welsh. Yetters was more pedantic than his fellows; little wreaths and buds grew complete under his touch, even his scrolls and festoons were limned in

conscientious manner, and he used blue lavishly; his work is in strong contrast to that of the impressionistic Witmer.

The following list of articles is taken from an advertisement which one of Stiegel's Philadelphia houses issued to their trade:

Double and single flint gallon, three quart, half gallon, and single quart decanters with stoppers; sugar loaf ditto; round ditto single and double flint tumblers, pint measure; half pint ditto and gills; tall pint tumblers, pints and half pints; enameled mason wines; enameled twisted mason wines; plain ditto; common wines; twisted ditto, enameled ditto; syllabubs, with one handle; ditto with two handles; bubbled buttoned jellies; common acorn ditto; jacony salts, and enameled ditto; double and single cruets; enameled three footed creams, common ditto; three footed salts; enameled blue and plain; inks of all sorts; and flower pots; garden pots; proof glasses; lemonade jars; candlesticks, ornamented; servers, ornamented; common and enameled mustards; vinegar and oil cruets, joined together; and a great variety of glasses too tedious to insert.

CAULLMAN AND FEGAN.

Second Street, Philadelphia, fifth door from Race Street.

The public may rest assured that no other kind of glass will be kept, or sold in said store.

Salts are found in clear glass, cobalt, amethyst, purple, emerald, and (rarely) amber. The Hunter collection in the Metropolitan Museum of Art contains ten varieties of the clear glass, salt, and twelve varieties of the cobalt blue.

Cream-jugs or pitchers are found in clear glass, cobalt, emerald, amethyst, purple, and (rarely) amber. The Metropolitan Museum collection contains twenty-five beautiful varieties of cobalt cream-jugs.

Sugar-bowls or boxes are found in clear glass, cobalt, and (more rarely) emerald, amethyst, purple, and amber.

Christmas-tree lights were made in nearly every color employed by Stiegel's workmen. I have also seen some of these lights, which I believe are authentic, in colors not commonly used at Manheim. It is possible that the blowers experimented with these little glistening cups for their own, and later their children's delight. These pieces should not be confused with those which were used in our early Catholic churches as altar lights, though some of them are very similar. Nor should they be confused with lights such as were used to illuminate Vauxhall Gardens in London, at the Battery Park in New York, or those which were strung about our Centennial Exposition at Philadelphia in 1876, or at the World's Fair at Chicago in 1893.

The archives of the Pennsylvania Historical Society contain the following list of Stiegel glass—evidently an inventory, or part of an inventory, of the pieces on hand in the stock of the Manheim factory at a certain unstated time. Part of the list is in Stiegel's own handwriting.

Quart Decanters, moulded	923	Tall Salts	757
Quart Decanters, plain	1968	Beer Glasses	32
Pint Decanters, plain	6374	Sugar Bowls and Cover	312
Half Pint Decanters, plain	3319	Pocket Bottles	6214
Sundry large Tumblers	29	Cream Jugs	2057
Pint Tumblers	3153	Vinegar Cruets	791
Half Pint Tumblers	8900	Smelling Bottles	585
Gill Tumblers	4740	Fine Wine Glasses	223
		Plain Wine Glasses	5648
		Bubled Glasses	77
		Phials	6318

The Stiegel Output

Half Gill Tumblers	2	Glasses	3
Half Gallon Tumblers	3	Free Masons	2
Quart Mugs and Bowls	527	Junk Bottles	345
Pint Mugs and Bowls	1387	Toys	251
Half Pint Mugs	940	Mustard Bottles	1354
Half Pint Cans	475	Fine Water Glasses	24
Large Glasses	29	Fine Beer Glasses	48
Salts	301	Mustard Pots	1152
Plain Salts	508	Pocket Bottles	292
Common Salts	5748	Junk Stand and Glasses	130
Chain Salts	207	Candle Stick	4
Salts with feet	585	Blue Flower Jars	3

The following colors have been attributed to Stiegel glass:

light sea-green	cobalt-blue
nile green	sky-blue
emerald-green	amethyst
olive-green	purple
olive	rose
olive-brown	pale amber
dark-red brown	deep amber
	canary

Of the few bicolor combinations employed by Stiegel, the most common is opaque white and cobalt blue—or clear glass and cobalt blue. Much of the enameled ware ten years ago accredited to Stiegel is now known to be old German, Bavarian, or Dutch glass; many of the engraved mugs, tumblers, and flips are now believed to have been made by the New England Glass Co. and the Boston and Sandwich Glass Company; part of the blown cobalt ware, such as undecorated sugar-bowls, is known to have come from the Pittsburgh district, New York and Massachusetts;

many of the chestnut types and swirled types of flasks and bottles are now identified as Ohio-West Virginia output; none of the insufflated glass once attributed to Stiegel is now recognized as such, the Massachusetts houses receiving credit for at least most of the white, purple, and cobalt examples; many of the wine-glasses and decanters are accredited to Amelung, Fisher, Gillerland, and Camden; and quite recently several of the double-domed expanded types of sugar-bowls, which would have unhesitatingly been included in the Manheim catalogue five years ago, have been authenticated as mid-Western. Stiegel's workmen traveled westward, practising a similar technique in the early nineteenth-century furnaces.

The famous Stiegel type of cobalt covered urns, or drug jars, were blown at other glass-works, particularly European houses; while Massachusetts, Ohio, West Virginia, western Pennsylvania, Maryland, and Keene (New Hampshire) glass-works made much of the glass we like to call by this magical name.

It has been conclusively established that Stiegel used the following decorative forms: depressed ovals and circles, parallel and spiral moldings, fluted and reeded forms, lattices, diamond diaperings, foliated and floriated scrolls, flowers (especially the tulip, fuchsia, and rose), leafage, letterings, emblems, mottoes, birds, animals, and human figures. The Stiegel pontil mark is uniformly large, and at times it is partially obscured by indentations from the workman's tool, radiating around the pontil mark, or by having the rough edge of glass smoothed down.

No one has ever been able to differentiate between some of the Stiegel glass made during the experiments at Elizabeth Furnace and that produced at

Manheim, although it is only reasonable to suppose that the finer kinds of glass were made at Manheim—by the foreign workmen imported for this purpose. But while we are perfectly safe in saying that certain types were not made at Elizabeth Furnace, we cannot say that certain other types were made there and *not* at Manheim.

As a general rule, the collector should beware of bargains in so-called authentic Stiegel glass. The large majority of authenticated pieces have already been gathered into private collections and museums, and a genuine specimen never lacks for a ready buyer.

CHAPTER XVIII

KENSINGTON AND "DOCTOR" DYOTT

At the time when Stiegel was busily making glass in Lancaster County, Pennsylvania, Robert Towars (a leather-dresser) and James Leacock (a watchmaker), two Englishmen who had settled in Philadelphia, decided that the domestic manufacture of glass was absolutely essential to the colonies. The repeal of the Townsend Act only added to their determination to go into the glass-making business, and they accordingly embarked upon this venture in October, 1771, when they bought a strip of land on the east side of what was then Bank Street but later became Richmond Street, in the old district of Kensington, Philadelphia, where the run emptied into the Delaware River. The property had a frontage of one hundred feet, and extended back to the river.

The January, 1772, issue of the "Pennsylvania Gazette" contains an advertisement of "The glass facture, North Liberties, next door to the sign of the Marquis of Granby, in Market St., where the highest price is given for broken flint and alkaline salts." This leads us to believe that Towars and Leacock attempted to make flint-glass. The cullet was to be delivered at Towars's leather shop in Market Street. Evidently the factory did not pay, for in the same year it was sold to John and Samuel Elliott, druggists and dealers in spices and other commodities imported for colonial consumption. They took Isaac Gray into partner-

ship, probably as superintendent of the works. For eight years the factory was operated as an adjunct to the Elliott shop, for making the various kinds of bottles used in their business, as well as looking-glass; and for part of this time as "a flint-glass works for the accommodation of the general public." The shop of John Elliott & Co. was situated in Front Street, between Walnut and Chestnut streets. In 1779 the Elliotts advertised as follows:

> The Proprietors of the Glass House, near the city having now produced a set of good workmen, and the works being in blast, the public are therefore informed that they may be supplied with most kinds of White and Green Glass Ware, such as are usually imported from Great Britain, and at moderate prices which it is hoped will induce the friends of their country and their own interest to promote the undertaking.
>
> Orders from Store Keepers and others, both of town and country, will be executed with care and despatch, and a reasonable price given for White and green broken glass.
>
> A person Who understands the making of window-glass in the English method, may find encouragement by applying above.

In 1780 the works was sold to Thomas Leiper (Lepper), a well-known tobacconist of the city, who bought it for the purpose of making bottles for his snuff. Leiper ran the factory successfully for twenty years. On March 6, 1800, it was purchased by James Rowland, James Butland, and Joseph Roberts, Jr., who paid $2333 for the property, subject to $70 ground rent. The glass-house operated under the trade-name of James Butland & Co. for a little more than three years; Roberts then withdrawing and selling his one-

third interest to Butland and Rowland for $2548. In 1804 the latter two dissolved partnership, Rowland buying the entire works. The former firm had sold their glass at No. 80 North Fourth Street. In 1808, bottles made at the Kensington Glass Works were advertised for sale at No. 93 North Second Street. James Rowland was also a prominent iron merchant. He died in 1833, and that same year his son sold the factory to Thomas W. Dyott, who had been acting as one of its agents.

Dyott is one of the most interesting characters in the annals of our early glass-making. His effrontery and enterprise had made him the patent-medicine king of his day. In reality, he established the "cure-all" nostrum on a firm foundation in the life of the American people. A "doctor" only by self-appointment, this man worked, or professed to work, wonders.

Of English and Scotch parentage, Thomas Dyott arrived in Philadelphia in his late twenties or early thirties. Almost penniless after having paid for his passage overseas, he rented a cellar in some Philadelphia house or store, put out a boot-blacking sign, and began to polish boots, using blacking which he made himself by night. He was soon able to rent a little room above the basement, a large window in the front of which afforded ample means for a fine public view. The passer-by halted, hesitated, and was lost, as he gazed through the window and saw the ambitious young Dyott shining shoes within. His blacking must have been good, for this man never did things half-way. He was also a good boot-black, for customers flocked to the little shop.

In 1807, Dyott opened a "Patent medicine warehouse: No. 57 South Second Street." In 1809, he

advertised that he was now the owner of a "Medical Dispensary and Proprietor of Robertson's Family medicines, No. 116 North Second Street." A year later he appropriated the title "Doctor of Medicine," adding "M.D." to his name. In 1811 his drug store was situated on the northeast corner of Second and Race streets. The business soon branched out, until he had a network of agencies all over the country; his wares were advertised and heralded as far westward as the country was settled. Testimonials as to the curative values of his patent medicines appeared in remote village papers. The man became rich. Like Stiegel, he adopted a mode of extravagant living. In 1819 he kept "the most elegant riding establishment in this city or county, driving four horses to his elegant English coach, with three or four riders."

In addition to his patent-medicine business, the public was informed that orders for various sorts of bottles could be left at Dyott's Drug Store, where a large and general assortment of containers was kept constantly on hand. "The Democrat Press" of Philadelphia for September 17, 1817, carried a notice that his stock included

> Vials, from half ounce to eight ounces, Patent Medicine Vials of every description, Mustards, Cayennes, Capers, Anchovies, Also Rapee and other Snuff Bottles, half pint, pint and quart Seltzers, pint, quart and half gallon bottles and jars, Sweet Pie, Camphor, Globes, Tubes, Retorts, etc. To serve the trade packages, at Factory prices, or in smaller quantities at advantageous prices.

The following year he advertised "five thousand Mustard Bottles of very superior quality cheap." He was then agent for the Olive Glass Works and the

Gloucester Glass Factory. In 1825 we find the "Philadelphia National Chronicle" advertising a long list of glass commodities carried by "Dr." Dyott, and manufactured by the Philadelphia and Kensington Glass Factory. The most interesting items in this list are three thousand Washington and Eagle pint flasks and three thousand Lafayette and Eagle pint flasks. This establishes proof that the Kensington works made the Washington and Lafayette models in the year when one would naturally suppose our glass-manufacturers would celebrate these two beloved heroes.

In 1826 the "Pittsburgh Mercury" and other journals carried the following self-explanatory advertisement:

APPROVED FAMILY MEDICINES

Which are celebrated for the cure of most diseases to which the human body is liable, prepared only by the sole proprietor.

T. W. Dyott, M.D.

Grandson of the celebrated Dr. Robertson, of Edinburgh.

Stomach Elixir of Health.
Vegetable Nervous Cordial.
Celebrated Gout Drops.
Stomachic Bitters.
Infallible Worm Destroying Lozenges.
Patent Itch Ointment.
Infallible Tooth Ache Drops.
Anti Bilious Pills.

He also sold the following compounds prepared by others:

Ointment for the cure of Tetter, Ring Worm, etc.
Embrocation for the Rheumatism.
Vegetable Balm of Life.

Balm of Iberia (for the Complexion).
The Circassian Eye Water.
The Restorative Dentifrice.

On July 10, 1833, as already noted, Dyott bought the Kensington Glass Works. The property had by this time expanded until it included between three and four hundred acres on the Delaware River. Dyott improved and enlarged the factory, and was shortly operating five separate furnaces, one for vials, one for bottles, one for demijohns, one "for vessels indispensable to utility," and the fifth for exactly what we do not know. Nearly four hundred hands were on the pay-roll, including from forty to fifty blowers, who were paid good wages. A community life such as was established by Amelung, soon sprang up about the works. Dyott was also the first glass-house owner who inaugurated a twelve-month working schedule. The community had a hospital, a library, a singing-school, and a preacher. But Dyott soon had difficulties of the same sort encountered by so many of our early glassmen—difficulties due to intemperance among his workers, nearly all of whom had come from Europe. In an effort to eradicate this evil, he dismissed a number of the offenders, retaining only those who bound themselves to rules of semi-abstinence; and then founded "Dyottville," or "Temperanceville" as it was locally termed.

Owing to the expenditure of too much money in idealistic undertakings, as they affected the life of the community, Dyott became financially involved in the operation of his Manual Labor Bank in Philadelphia, an unchartered institution. In 1838 he was convicted in the courts of fraudulent insolvency and the

works were temporarily closed, but were reopened and operated until sometime in the sixties. Dyott died in 1861.

It is evident that Thomas W. Dyott was a man of originality, resourcefulness, and ambition. His desire for publicity, which probably led to the stamping of so many of his bottles, has been a boon to the collector. Dyott was fortunate in having the services of several excellent mold designers and makers, including the now famous Philip Doflein. The factory was soon reopened under another management, and operated until late in the sixties.

The Kensington works turned out large quantities of bottles of every description, including many exceedingly meritorious flasks, of pictorial and historical design, the popularity of which is attested by the fact that more of the Kensington designs were appropriated and copied by other glass-manufacturers than those of any other factory making bottles. Such as the Jenny Lind, the Louis Kossuth, and the busts of famous heroes. The metal was of good quality, the shapes were well proportioned, and the designs were well balanced, as is exemplified in the "Cornucopia, reverse Basket of Fruit" flask. The colors ranged from clear white and aquamarine to dark olive-amber and sage-green, in what may be termed the "bottle colors." Not content with the ordinary colorings, the Kensington works employed a variety of beautiful blues, from ultra-marine to a rich cobalt, also brown and citron. In addition to whisky-flasks, the variety of patent-medicine bottles, snuff-jars, capers and pickle bottles, demijohns, carboys, etc., which we can fortunately identify as Kensington glass is so great that

a detailed monograph would be necessary for its adequate classification and description.

Mention of one other early glass-making experiment in Pennsylvania may perhaps best be made here, although it has no connection of any sort with the Kensington enterprise. Robert Morris and John Nicholson, well-known Philadelphians who were speculators in many a colonial venture, took a little "flyer" in the glass business in 1786, building a furnace two miles above Philadelphia on the Schuylkill River. We know little about the works other than that William Peter Eichbaum became superintendent of the factory, and was thus engaged when he agreed to go West to take charge of the O'Hara-Craig operations.

The output consisted of bottles, and, possibly, some window-glass. Production is believed to have stopped under this management in 1790.

In 1810 and later, Philip Jones & Co. were conducting a Schuylkill Glass Works as a bottle factory, its output in 1813 including gallon and half-gallon case and porter bottles; quart and pint flasks; half-gallon, quart, and pint jars; snuff and blacking bottles. Presumably, this was a continuation or revival of the Morris-Nicholson enterprise.

CHAPTER XIX

GLASSBORO, NEW JERSEY. THE STANGERS AND THE WHITNEYS

The colonial province of West Jersey, better known among glass-collectors to-day as "South Jersey," holds a place of rightful importance in the annals of American glass-making. Not only did its furnaces produce a large amount of meritorious ware, but it was probably the birthplace of traditions which, carried by its artisans to other factories, had their influence upon much of the subsequent American output.

Authentic records dealing with Jersey's early glass-making are scarce. Such investigators as Hugh M. Durigan, Malcolm Vaughan, Charles S. Boyer, and the Bodine and Sinnott families have seemingly exhausted every available resource, but the resulting information is still fragmentary and confused. This is particularly true in respect to the Glassboro works, established in Gloucester County by our greatest (numerically speaking) family of glass-blowers—the Stangers.[1]

This family seems to have consisted of seven brothers, named Jacob, Solomon, Daniel, Peter, Christian, Adam, and Philip, although two other names, those of John and Francis, are sometimes added to the list. Possibly two of these nine given names belonged

[1] In contemporary records this name appears in at least seven different forms: Stanger, Stenger, Stinger, Staenger, Steenger, Syanger, and Sanger.

to a younger generation, or were the additional names of two of the original brothers.

It is generally supposed that the Stanger brothers had been employed at the Wistar glass-works previous to their founding of Glassboro. According to Thomas W. Sinnott, a member of the firm which later operated the Whitney glass-works on this site, they left Wistar's employ in 1774 or 1775, and immediately purchased and cleared a tract of pine timber-land in Greenwich Township, Gloucester County, where they erected a glass-works and laid out a settlement which they called Glassboro. Other authorities, however, believe that the Stangers did not leave Wistar's employ and erect the Glassboro works until 1781. Mr. Charles S. Boyer, president of the Camden County Historical Society, states that close research does not reveal the name of Stanger (or any of its variations) on any local deed or township poll-list before 1780; although the Stanger brothers appear as householders on the tax duplicate from 1781 onward.

The factory built by the Stangers was situated in the northern end of the present borough of Glassboro. Although very small, it was then the largest manufacturing concern in Gloucester County. The main output of the works under the first ownership is believed to have been bottles and window glass. The metal was coarse, and the forms were probably similar to the squat round-shouldered long-necked types made at the Wistar works in its earliest days.

In 1783, Thomas Carpenter and his brother-in-law, Samuel Tonkin, bought the interests of Francis, Peter, and Philip Stanger, and became "Tennants-in-common" with Solomon and Daniel Stanger. In 1784, Solomon Stanger sold one-fourth interest to Colonel

Thomas Heston, the conveyance deed calling for one fourth of the "tools and implements belonging to the Glass House for Blowing and framing of Glass." Solomon also disposed of his one-fourth interest in the land, etc., the price paid by Heston being £330 "Gold and Silver." At the same time, Daniel Stanger sold his one-fourth interest to Samuel Tonkin for a like consideration. Judgments then due against these two brothers for some £110 may have had something to do with their disposal of their shares. After October 20, 1784, it is probable that none of the Stanger brothers owned any interest in the works, although they may have continued in its operation as employees.

In 1784 the new ownership of Heston & Carpenter began making window-glass and flintware, in addition to the original output of bottles. Colonel Heston managed the works; while Thomas Carpenter, who had a general store at Mantua, New Jersey (then called Carpenter's Landing), attended to the shipping of the finished product by boat to Philadelphia. Heston died in 1802, and his widow operated the plant in conjunction with Carpenter. In 1808, Peter Wickoff purchased the Heston interest, and Edward Carpenter took over his father's share, the new company being styled "Edward Carpenter & Co., The Olive Works." Under this management, the factory was successfully operated until the sudden death of Edward Carpenter in 1813, after which the business declined. In 1816, Wickoff sold his half-interest to David Wolf, and a year later the executor of Edward Carpenter's estate also sold the latter's interest to Wolf. The price paid was $4559.43.

David Wolf, now the sole owner, renovated and

improved the factory buildings, adding a new pot-house and other needed improvements. In 1818 he sold a quarter-interest in the works to Daniel Pfotzer (or Focer, a grandson of one of the original Stangers) and another quarter-interest to Isaac Thorne. In 1821, Thorne became sole owner. Three years later this much-owned industry was purchased by Jeremiah J. Foster, who merged it with an adjacent factory at Glassboro known as the Harmony Works, which had been built in 1813 by a number of the older glassmen from the Olive Works under the leadership of some of the Stangers and John Rink, using the firm-name of Rink, Stanger & Co. John Rink managed the selling end of the business from Philadelphia, and also acted as agent for the purchase of supplies. He died in 1823, his interests being taken over by Daniel K. Miller, a well-known glassman of South Jersey, who at that time was proprietor of the Franklin Glass Works at Malaga.

From a contemporary advertisement in "The Village Herald" of Woodbury, New Jersey, we learn that the Harmony Works consisted of a "large Glass House, Pot House, Mill House, Packing House, Store House, several dwelling Houses, etc., comprising a complete establishment." Lewis, the only remaining Stanger actively connected with the business, withdrew in 1834. The following year a third-interest was sold to Thomas H. Whitney: and four years later Whitney and his brother Samuel became the exclusive owners, adopting the firm-name of Whitney Brothers. These two Whitneys were grandsons of Colonel Heston and sons of Eben Whitney, the latter a sea-captain from Castine, Maine, who in 1803 was wrecked in a hurricane off the South Jersey coast near Cape May;

soon thereafter he met the daughter of Colonel Heston, married her, gave up seafaring life, and settled in Glassboro. For forty-two years the Olive and Harmony works were operated by the Whitneys as a combined plant, which became one of the largest bottle-making houses in America. It is now a part of the Owens Bottle Company.

A number of authenticated "offhand" blown specimens of South Jersey glass now in American collections have been found in the Glassboro region. Made between 1800 and 1850, they represent examples which only a few years ago were catalogued as Wistar. They include vases, bowls, and cups in dark amber, whorled bicolor pitchers and bowls, deep-blue vases and bowls, and light green specimens. Many of the bowls have reamed edges.

We also have collectors of the later Whitney brothers' productions, the houses under their ownership turning out some of the most interesting patent-medicine bottles made in this country. Occasionally these containers are found in a clear-toned grass-green color which gives them an added attractiveness and rarity; the green "Indian Queen," "Ear of Corn," and "Booz" bottles being real collector's pieces, although made in the eighteen-seventies. Among the best-known bottles and flasks made by the Whitney brothers are the following:

Jenny Lind calabash with six-pointed star
Hunter and Fisherman calabash
E. C. Booz Whiskey (aquamarine, light and grass-green, amber)[1]

[1] The date, 1840, on this bottle has nothing to do with the year in which the container was made, but probably refers to the year in which the whisky sold in the bottle was distilled.

Brown's Celebrated Indian Herb Bitters (Indian Queen), 1868
Ear of Corn
Charles Wharton's Chestnut Grove Whiskey
Pine Tree Cordial
Plantation Bitters
Warner's Safe Cure
Tippecanoe
Flora Temple
Hexagon Pepper Sauce
Harrison-Tippecanoe Ink
Twelve-sided Columbian Ink
Half-gallon hexagon pickle bottles
Octagon pickle and capers bottles.

The Whitney houses did not specialize in any particular type of bottle, although they were prolific producers of the calabash and octagon-arched pickle-container forms and they turned out an enormous quantity of amber patent-medicine bottles. The factories were efficiently equipped with the latest improvements, and employed the best of die-makers, modelers, and mold-chippers. A price-list issued in the early sixties includes the following articles:

Window, Coach and Double thick Sheet Glass
Cod Liver Oil Bottles
Round Castor Oil Bottles, Long Neck
Promiscuous Articles
Ink Bottles, Ink Stands
Concave, Octagon, Oval and Fluted Castor Oils
Carboys Finished with Patent Tools
Rhine Wine Flasks with Handles
Squares and Oblong Squares
Acids and Tinctures
Packing Bottles, Common, and Extra Heavy Lip

Wine and Liquor Bottles of Every Description
Porter, Ale, and Mineral Water Bottles
Jelly and Preserve Jars
Pickle Jars, Olive Bottles, Caper Bottles
Mustard and Worcestershire Bottles
Pepper Sauce or Catsup Bottles
Olive Oil Bottles
Horse Radish Jars
Lemon Syrups
Flasks, Bottles
"Specie" Jars
Snuff Jars of All Sizes
Crockery Dealers' Ware.

In 1856 anthracite coal was first used as fuel at Glassboro, this being superseded a few years later by bituminous coal. It was brought to Carpenter's Landing by boat, and then hauled by ox-team to the works. In 1861 the West Jersey Railroad was completed to Glassboro, affording greatly improved shipping facilities.

CHAPTER XX

ROBERT HEWES AND THE EXPERIMENT AT TEMPLE, NEW HAMPSHIRE

It is thought that the lovely little village of Temple, in lower New Hampshire, was the scene of the first effort in American glass-making after the United States had become an independent nation. In 1781 a small furnace was erected there by Robert Hewes. The glass-house, occupying sixty-five square feet of land, was situated in the southwestern part of the town. The surrounding pot-house, drying-sheds, and other necessary structures were built of logs. The main building is said to have been as high as the Old Temple Meeting-House.

What manner of man was Robert Hewes of Boston, and why did he select a site in New Hampshire for a glass-works?

Born in Boston in 1751 of English parentage, Hewes as a young man came into a considerable fortune upon the death of his father. The elder Hewes had been a tallow-chandler, an important and dignified occupation in colonial days, and the youth inherited what was in those times considerable wealth. Versatile, polished, abounding in energy and ambition, he felt no inclination to carry on the business of his father. By chance, a copy of Chambers's Encyclopædia fell into his hands, and as he was casually glancing through it his eye was arrested by a five-page account of the composition, chemical analysis, history, and manufacture of glass. He became obsessed with the

idea of making glass, although his friends tried to dissuade him. He began experimentations, and was soon engrossed in the various formulæ.

At this period the English embargo on manufacturing in the provinces was rigid and drastic. At the same time, the prohibition of all glass-shipments from foreign ports had become keenly felt by our people. While blockade-runners managed to smuggle in shot and shell, of which our army was in dire need, commodities such as glass and "chiney-ware" had become increasingly scarce during the Revolution. Young Hewes believed that he could partially fill the void.

In May, 1780, Hewes arrived in Temple, and began the erection of a glass-works. He selected this site for several reasons: the price of the land was next to nothing; living conditions here were exceedingly favorable; there was an abundance of fuel; hardwood ashes for potash could be easily had; sand could be conveniently hauled by ox-team from Magog Pond, in the neighboring town of Littleton, Massachusetts—although, had Hewes but known it, sand of good quality was plentiful around Temple.

Following the completion of the works, the furnaces had been fired for only a few melts when trouble began for Hewes. He had brought with him to Temple as workers a ragged band of Hesse-Waldeckian deserters from the British Army—men who were supposed to know something of the mysteries of glass-making. These men proved a carousing, hard-drinking lot, whose actions soon disgusted the sober townspeople of Temple. Hewes was beginning to worry over the situation when, according to the Temple History, "the fireman got drunk and conflagration thence resulted." The glass-works was consumed. Hewes immediately set to

work and constructed new buildings on the site of the first ones. Desirable stones for the furnace were hauled in ox-carts from Uxbridge, Massachusetts, a distance of sixty miles. No time was lost in completing the plant for the winter's work. But a severe frost weakened the furnace, so that when it was first fired the entire structure gave way. Thus Hewes's second attempt also ended in disaster.

Short of ready funds, Hewes next tried to interest the inhabitants in subscribing money toward a third venture. A few of them had put a little capital into the second house, and their loss tended to make the populace look askance at the new plan. With their refusal to coöperate in the proposed industry, Hewes appealed to the Town Council and to the House of Representatives of New Hampshire, petitioning that he be exempted from taxation on the property and that his workers receive a bounty. That body voted favorably to receive his petition, but postponed the payment of a bounty to his workers. Its members "believed that encouragement should be given him," but they did not give it.

In the winter of 1780, Hewes petitioned the selectmen of Temple for funds, but they were afraid to take the risk of such a precarious investment or loan. Disgusted and discouraged, Hewes had gone back to Boston, leaving the Hessians encamped in log houses near the ruins of the works.

On March 5, 1781, the town of Temple voted to advance Hewes a loan of £3000 provided he could give good security, "to be assessed in two months and collected as soon as may be." On this same day Hewes's agent at the works wrote to the selectmen, requesting provisions. A week later Hewes declined the proffered

loan, stating that he did not wish to assume the risk and responsibility of the conditions attached. He also remarked that ten times this amount could be raised by him in Boston should he want it, but that he now proposed to abandon the project at Temple and withdraw the workmen if no one appeared to purchase the remaining homes, tools, and grounds.

Two weeks later, in a letter written from Boston on March 24, 1781, he proposed to the selectmen of Temple that he be supplied with funds on a loan, in view of a lottery for which the General Court of New Hampshire had been asked to grant privilege. The Lottery Act was passed March 30, "giving leave to raise £2000, new emission, for the Temple glass works," and appointing three men to conduct the lottery, report their proceedings, and account to the General Court within one year. But unfortunately, the lottery tickets would not sell.

Hewes returned to his Boston home on the corner of Washington and Essex streets. Before the Hessians could migrate elsewhere, smallpox broke out in the district, and many of the men fell victims to the epidemic. We do not know what became of the survivors. Thus ended the Temple glass-making experiment.

In 1787, Robert Hewes became one of the organizers of the Essex Glass Works of Boston. He also became interested in a soap-factory, a glue-house, and a slaughter-house, which were doubtless operated in conjunction. An expert in fencing, he taught this art to the élite of the town; he wrote and published "Rules and Regulations for Sword Exercise of Cavalry" (1802) and "Formations and Movements of Cavalry" (1804). He was familiar with surgery; he possessed a peculiar talent for bone-setting; he compounded a

very popular embrocation called "Hewes Liniment."

This versatile man, who set bones, supplied the oil for their healing, and made the bottle for the liniment, could at the age of seventy-five years wield a foil more proficiently than any other man in the town, although it is said that he was then "little and rotund." He died on July 21, 1830, at the age of seventy-nine, and is buried in Tomb Number 18 of the Common Burying Ground in Boston.

The quantity of glass blown at the Temple works was so small, before the initial catastrophe, that we are fortunate in having a few surviving authenticated pieces. (The Hewes plate supposed to be at Harvard University is a myth.) Mr. Stephen Van Rensselaer, after diligent search, has found a specimen which we may accept as genuine. It is a bulbous gallon bottle, formerly wicker-covered and green in color, exactly duplicating fragments unearthed about the ruins of the factory. It has been handed down from one generation to another from the day it was obtained from the glass-house.

One or two other pieces have come to light, including a crude tumbler of greenish-white window-glass, irregular in form, with banded rim, and about four inches in height, the property of Mrs. Mary Bales. A descendant of the Hewes family claims to have a greenish decanter blown at this works; while a few years ago a round greenish bottle attributed to Hewes's Temple factory stood on the mantel of the dining-room in the hotel at New Ipswich. This bottle was of three-gallon capacity, it was well proportioned, but the glass was cloudy and grains of sand were scattered through it. These are the only authenticated specimens of which I know.

CHAPTER XXI

THE DOWESBOROUGH, HAMILTON, AND SAND LAKE WORKS

John and Leonard DeNeufville, wealthy members of the Dutch aristocracy, sacrificed their fortunes (estimated at a half-million pounds sterling) in helping the cause of the American struggle for Independence. John DeNeufville was one of the negotiators of the treaty between Holland and the American Congress, which became one of the prime causes of the war between Holland and England in 1781. Moved by the highest ideals of patriotism, these cultured gentlemen, who had lived in a state of splendor in Amsterdam, came to America; and after their worldly possessions had been almost entirely given away they invested the little that remained in a small glass-industry near Albany, New York. This settlement, called Dowesborough, was eight miles from Guilderland, near Sand Lake.

With the aid of two Hollanders—Jan Helfke (Heefke) and Ferdinand Wolfa (Walfahert), probably practical glassmen—whom they brought with them, they built a little furnace in a hilly and thickly wooded section of the Berkshire country. Although they were in the finest sand district in America, they did not realize it, and like other early manufacturers similarly situated they advertised for suitable silica, offering a reward of fifty dollars to the person who should dis-

cover sand within a radius of ten miles from the furnace.

The details of their operations are as meager as the crumbs from Lazarus's table; and such details also differ concerning dates, location, names, and period of operation. The years 1783, 1784, 1787, and 1788 are variously recorded as the time of the first blasting. It is likely however, that the works was built late in 1783, that the first melt occurred in 1784, and that the plant operated intermittently until 1787, when owing to lack of funds the fires were drawn.

John DeNeufville lived in a little log cabin adjacent to the glass-house. He was finally reduced to the most abject poverty, Elkanah Watson of Albany finding him in dire need of the necessities of life—a pitiful contrast to his earlier years of luxury and high position.

In the early part of 1792 the property was purchased at a very low price by McCallen, McGregor & Co., men of previous glass-making experience, who proposed to manufacture both cylinder-glass and flint-glass. According to an item in the "American Apollo" (a Boston periodical) for September 28, 1792, "they appealed to the Legislature for aid, stating that £30,000 was sent abroad annually for English-Irish glass." This appeal was evidently unsuccessful, for in 1793 they again petitioned the Legislature of New York State and were granted a loan of £3000 for eight years, the grant being free of interest during the first three years and bearing five per cent interest for the remaining five years. Another contemporary item in the "American Apollo" reads as follows:

> We learn from Albany that the Glass works erected several years ago within a few miles of that city, and which has been

deserted ever since for want of CASH is now owned by Messers M'Callen, McGregor and Co., who have completely repaired it, supplied it with every material, and are now manufacturing and advertising for sale WINDOW GLASS of every dimension. They want a good FLINT GLASS MAKER. As this manufactory must be of great public utility, it is to be presumed they will receive the greatest encouragement from all glass dealers.

Next to nothing is known about the early flint-glass produced by McCallen, McGregor & Co.—if, indeed any *was* produced.

Between 1793 and 1796, James Caldwell, a wealthy tobacco operator, Christopher Baltemar, Elkanah Watson, and Thomas and Samuel Mather entered the firm of McCallen, McGregor & Co. In 1796 the stockholders consisted, in addition to several of the above-named men, of Jeremiah Van Rensselaer, K. K. Van Rensselaer, John Sander, Douw Fonda, Abraham Ten Eyck, Frederick A. De Zing, and Walter Cochran. The company bought a considerable acreage about ten miles from Albany on the Great Schoharie Road, where its officers decided to embark upon the manufacturing business on a larger scale than ever before attempted in that vicinity. They proceeded to lay out a model village, which they named Hamilton, in honor of Alexander Hamilton; and here they erected a large glass-house, a general store, workmen's cottages, and several other buildings for the making of various commodities. In February, 1796, the State Legislature passed an act "for the encouragement of the Albany glass factory." The following spring the company was incorporated, both the incorporators and the employees being exempt from taxation for a period of five years.

As the owners of the works were influential business

men of Albany, the industry was given considerable publicity, and was able to place its output advantageously. In a year or two the company was running three furnaces in each of its two glass-houses, in addition to a large pot-house and a cross-cut sawmill. Thirteen glass-blowers, exclusive of apprentices and helpers, were on the pay-roll. It turned out an average of twenty thousand feet of window-glass a month, and a large quantity of bottles and flasks. The factory substituted calcined ashes of seaweed for pearlash in making its supply of carbonate of soda; its bottles were made with "hydraulic appurtenances"; and Munsell, in his "Annals of Albany," tells us that the house was "in good repute." Everything pointed to a long and successful undertaking.

But the Hamilton industry was forced to abandon operations from a cause which had not been foreseen —the exhaustion of the timber on its property-holdings. The East was as yet without coal for fuel; and with no canals, navigable streams, or railways for bringing in timber the works soon fell into disuse and decay. The plant closed down in 1815.

The villagers of Hamilton and the stockholders in Albany undoubtedly kept their households supplied with domestic glassware, such as bowls, pitchers, pans, etc., blown at the works after the ordinary commercial output had been attended to. On rare occasions a piece of this sort has turned up; but in general the collector may feel very well satisfied if he is able to secure one or two of the flasks stamped with the name, "Albany Glass Works." The metal in these flasks is fairly heavy; there is an extended central rib; the colors are aquamarine, dark greens, and occasionally amber; the sizes are usually half-pint and pint.

A group of Albany business men, excited by the success of the Boston Crown Glass Company, decided to build a glass-works in the Sand Lake-Berkshire district. With considerable capital at their command, they at first selected Sloanville, about ten miles west of Albany, as a suitable location; but upon further examination, they concluded that the sand was inferior and the timber insufficient for their needs. Turning northeastward from Albany, they negotiated for a five-thousand-acre wooded tract from the estate of the late patroon, Stephen Van Rensselaer, about twenty miles from Pittsfield, Massachusetts.

The State legislature of New York passed an act to incorporate the Rensselaer Glass Works on February 28, 1806, the incorporators being Jeremiah Van Rensselaer, James Kane, Elkanah Watson, George Pearson, Elisha Jenkins, Thomas Frothingham, Francis Bloodgood, Frederick Jenkins, and Rensselaer Havens. The capital stock did not exceed one hundred shares of $1000 each.

The plant was a large one for that day, having two cylinder-glass furnaces and one crown-glass furnace. After experimentation, the local sand was found to contain too much extraneous matter, producing a flecked and bubbly metal. A better grade was then carted from the silica-beds at Cheshire until 1816, after which the Lane sand-beds were utilized.

At the outset, the company was seriously handicapped by being unable to obtain skilled labor, the expedient of importing experienced workmen being a dangerous and costly procedure. The stringent laws enacted in Europe, making it a penal offense for a glass-worker to leave his country or for a person to induce him to leave, kept many artisans from coming

PLATE 17

Mr. Stephen Van Rensselaer

Ludlow bottles collected by Miss Evanore Beebe

PLATE 18

Metropolitan Museum of Art

Rare types of candlesticks and lamps

PLATE 19

Mr. George S. McKearin

Large insufflated bowl, sugar-bowl, and vases—attributed to Massachusetts

PLATE 20

Mr. Israel Sack

Opalescent wash-bowl (1820–45)—attributed to Massachusetts

PLATE 21 *Dr. J. H. West*

"Granddaddy" flask—attributed to Panhandle district
Pitkin type flasks with double-dipped bodies
Stiegel-Ohio types

Messrs. Weil and Sack

PLATE 22

Cobalt insufflated pitcher attributed to Sandwich and two clear-glass insufflated geometrical patterned pitchers

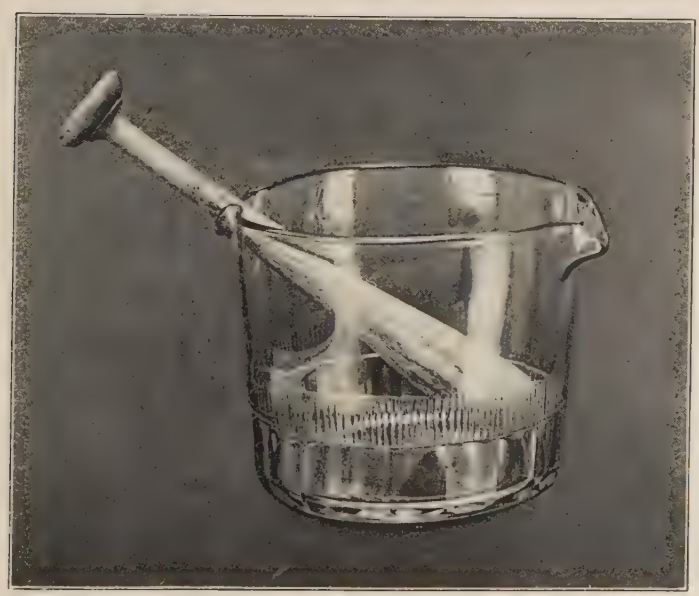


PLATE 23 *Mrs. F. M. Nichols and Mr. David Belasco*

Cut glass after the Waterford manner, New England Glass Co. and Gillerland

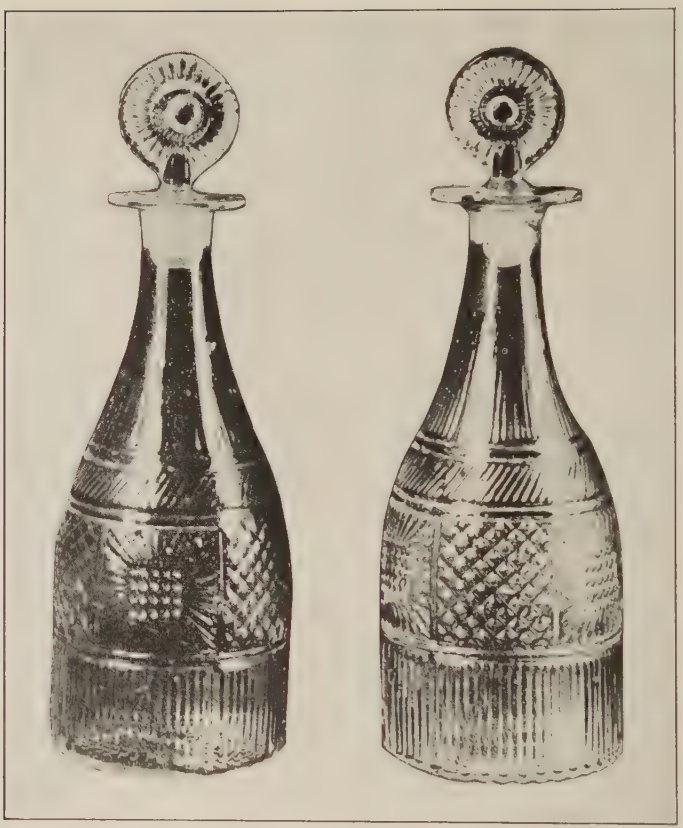


PLATE 24 *Mr. Henry V. Weil*

Iridescent green geometrically patterned decanters, with rayed stoppers, attributed to Keene, Kent, or Zanesville

Messrs. Sack and Schantz

PLATE 25

Four distinct types of sugar-bowls made at various flint-glass works

PLATE 26

Messrs. McKearin and Hayward

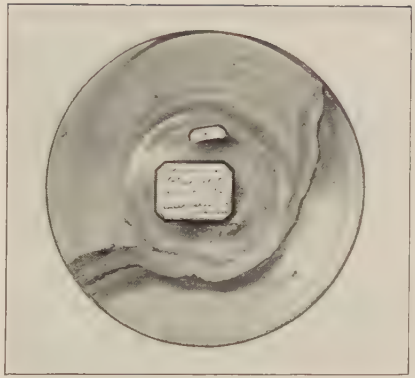
Baroque and geometrical examples of insufflated glass

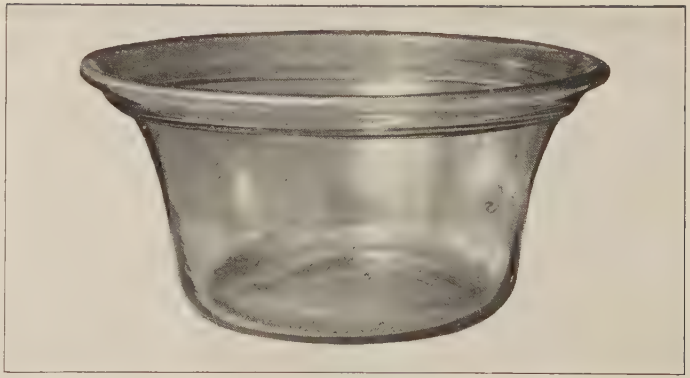
(No. 2—A pitcher blown in a four-section mold)

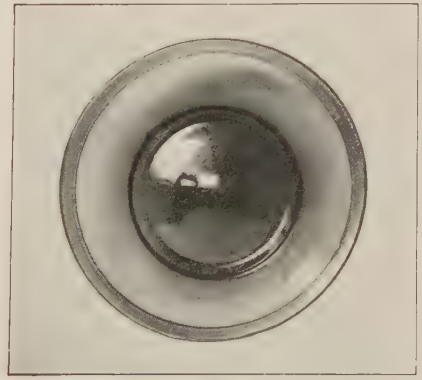
Mr. James H. Rose

PLATE 27

Harrison, Log Cabin with Flag pint flask, attributed to Monongahela or Ohio River glass-works







Messrs. Rice, Knittle, and McKearin

PLATE 28

Columbia plate. Citron bowl from Greensboro

Suncook, N. H., bluish-green bowl
Footed bowl attributed to Lancaster, N. Y.

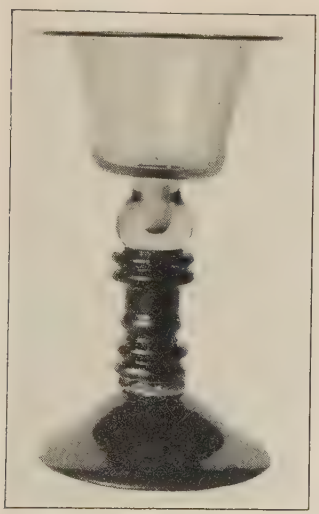


PLATE 29 *Mr. Homer Eaton Keyes*

New Jersey, New York, New England, and Zanesville types

PLATE 30 *Mr. Earl J. Knittle*

Ribbed and fluted expanded golden-amber bowl from Frederick-town, Md.

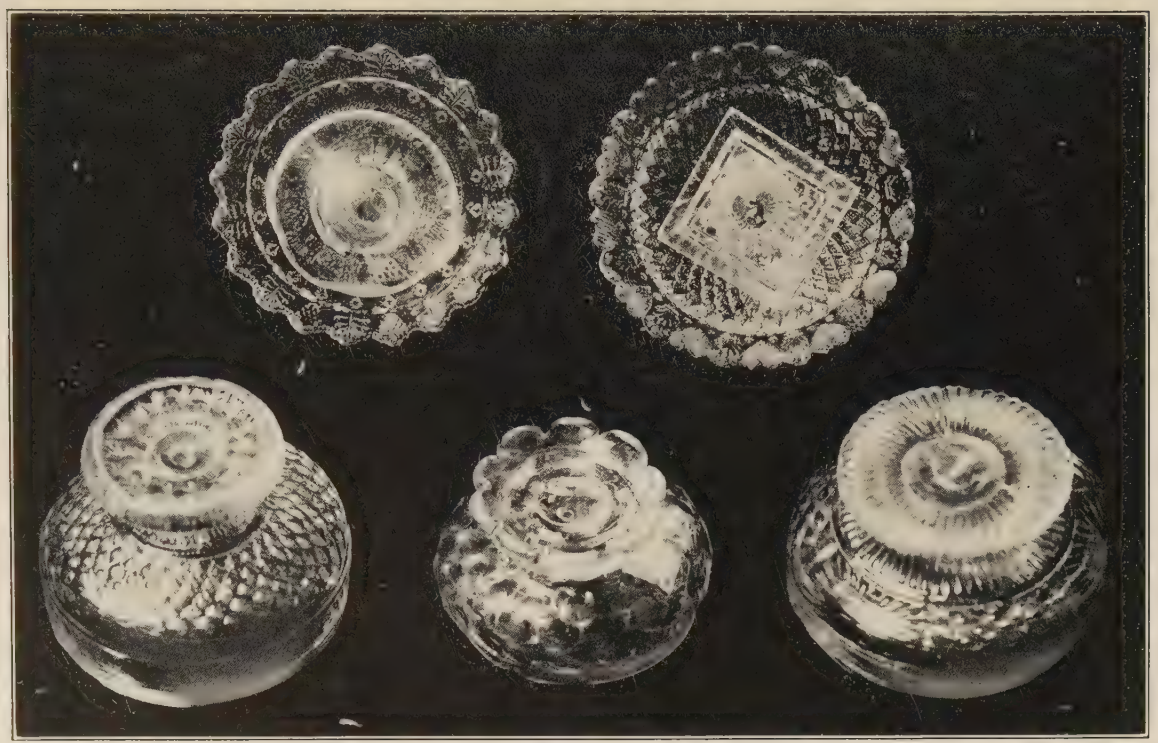


PLATE 31

Mrs. F. M. Nichols and Mr. Israel Sack

Blown base of pressed bowl and pressed base of pressed bowl
Bases of insufflated salts

PLATE 32 *Dr. J. H. West*

Types of bottles typical of the mid-Western district

to America. In this instance, William Richmond, a Scotchman by birth, went abroad disguised as a beggar with a patch over one eye, and strolling about the glass district of Dunbarton, Scotland, playing upon the bagpipes, he surreptitiously engaged blowers to cross the sea. Smuggling their tools aboard a ship, they were stowed away until there was no danger from pursuit. But, sad to relate, these "experts" proved a poor lot, being "addicted to carousing and extravagance" and "constantly neglecting their work at critical times."

In 1815 some of the Sand Lake blowers, while indulging in a card game in the packing-room, accidentally set fire to a pile of straw on which they were seated, and the plant was burned almost to the ground. This was a severe blow to the company; and on November 16 of that year the Albany "Argus" printed this notice: "Rensselaer Glass Factory at Sand Lake with all property concerned sold at auction at the Coffee House in Albany, Feb. 6, 1816. John Reid, Agent." What was left of the buildings and the large hilly wooded tract was included in the sale, the original owners "having suffered so much annoyance from their men" that they did not care to rebuild. The company dissolved in 1819. The property was purchased by Isaac Fox and Nathan Crandell, who remodeled the crown-furnace (which had been only partially destroyed) into a cylinder-furnace. Fox and Crandell turned out a large amount of window-glass, and the usual number of "offhand" blown specimens for neighborhood household consumption, until 1830.

For the three years, from 1830 to 1833, the plant was leased by Stadler, Rush & Co., former South Jersey glass-blowers, the company including the four

Gabler brothers—Joseph, William, Nelson, and John, each of whom took charge of a certain part of the work. In this and like manner, the outstanding technique evolved in and about Gloucester County, South Jersey, spread over New York State and upper New England, frequently retaining all of its original purity of form and decoration.

In 1833, Albert R. Fox and Samuel H. Fox, sons of the Isaac Fox who had been a former owner, took over the business, and ran it successfully until 1853, when fire entirely destroyed the plant. Albert Fox then became superintendent of the Berkshire Glass Co., assisting in the erection of the latter's new furnaces at Lanesboro, New York. Prior to the burning of the Sand Lake property, the Fox brothers had erected another glass-house at Durhamville, New York. Under the Fox management, Sand Lake prospered, the Gablers remaining with the concern and acting in various important capacities.

When at Sand Lake recently, I saw two examples of "offhand" glass made by the Gablers—a pitcher and a cane, both of a beautiful greenish tone. The pitcher had a bulbous body, crimped handle, and threads of rose plastically applied about its neck. The cane was striped with rose and opaque white threads of glass. I also saw two fan-lights and several small window-panes which were said to have been blown during the earliest period, their wavy unevenness seeming to attest the statement.

A large frame building called Mechanics Hall was erected by the Fox brothers to accommodate those of their workmen who had no permanent homes. This white painted structure still stands, doing service as a hotel for the passing tourist.

It is said that one of the Gablers mixed the metal, which was so pure that a part of the batch was barreled and exported to the Hawks Glass Company in England for the making of "blanks" used in that glass-cutting establishment, a portion of the finished ware being sent back to this country for distribution.

The Berkshire Hills still have their isolated charcoal-burners—such men as those who felled, hauled, and prepared the timber for the early glass-furnace of John and Leonard DeNeufville.

CHAPTER XXII

AMELUNG AND THE NEW BREMEN COMMUNITY

A most interesting experiment in early American glass-making was that conducted by John Frederick Amelung, a native of Bremen, Germany, who came to America in 1784 and established an extensive glass-works at New Bremen, near the mouth of Tuscarora Creek, four miles above Fredericktown, Maryland. Locally and to the outside trade, this house was variously known as the New Bremen Glass Works, the Etna Glass Works, the American Glass Manufactory, and Amelung's Glass Works.

The inception of this enterprise may best be told in the following extracts from a tract published by Amelung in 1787, under the title, "Remarks on Manufacture, Principally on the New Established Glass House near Frederick-Town in the State of Maryland":

In the beginning of the year 1784 a company was formed between some of the most capital houses in Bremen and the subscriber to establish a Glass-House in one of the most convenient parts of the United States of America: we got acquainted with Mr. Benjamin Crocket, from Baltimore, who was at the time in Bremen, and from what *we* learned from him, we choose this State for its establishment, with flattering expectations to meet here with encouragement in this great enterprise, that the principal materials, as wood and pot-ash, were to be had in Abundance, which I have since found, *likewise*, that the price of Glass, as soon as the Manufactory

was well established, were more advantageous in comparison, than those in England, and Germany, which they really are.

I had letters of recommendation from those great men, Franklin and Adams, and the American Consul at Paris, to the first men in this country, viz., to his excellency General Mifflin, President of Congress, Thomas Johnson, Esq., William Paca, Esq., and Charles Carroll of Carrollton, Esq. . . . All these letters prove that I had the Character of a worthy and honest man in Germany, and kept the same until I left it.

After a tedious and disagreeable passage of sixteen weeks, I arrived with 68 hands, the last day of Aug. 1784, in Baltimore . . . I had left an Agent behind, who arriving here, on the 22d of Nov. following with fourteen hands more . . .

My first occupation after my arrival was to look out for a place to establish the Glass-House. I have purchased an advantageously situated tract of land on Patowmack (Potomac) not far from the mouth of Monocasey (Monocacy) of two thousand one hundred acres, which except a small balance, is paid. . . On this land I have erected all the necessary buildings for the manufactory as glass ovens for bottles, window and flint glass, and dwelling houses *for one hundred and thirty-five* now living souls . . .

I have made a beginning of glass making . . . I am now building another glass oven, as I expect in a few months more Glass Makers from Germany, having sent in October 1785, an Assistant there to engage and bring them over . . .

I have established a German School . . . I am now about establishing an English School . . . that children may get a complete education in the same, as in the English, German and French languages, writing, ciphering, music, to play on the harp, harpsichord, flute and violin . . .

I also have purchased one thousand acres of land more and erected another new Glass House on that Spot all which is paid . . . if a moderate assistance should be given me the glass made here, will exceed the Imported in a Short Time . . . will soon be known from Boston to Charleston, in Carolina.

Amelung and the Bremen promoters had raised £10,000 in Germany, and £15,000 in America, for the purchase of land, the establishment of the community of glass-workers, and the erection of furnaces and incidental buildings. Two years after his arrival at New Bremen, he had spent from £7000 to £8000 in excess of the above-mentioned sums. In addition to the eighty-two glass-makers who came over in 1784, and the others who arrived later, he imported blacksmiths, bakers, shoemakers, tailors, teachers for the schools and for musical instruction, and a physician. Altogether there were from three to four hundred inhabitants of the New Bremen colony at the close of 1785. Nothing was overlooked which would make for an ideal transplanted German community. But unfortunately these carefully planned idealized communal or industrial settlements seldom realize their promoters' expectations, and usually disappear after a brief period of disillusionment. Such was the fate of New Bremen.

The severe winter of 1784 put many obstacles in Amelung's path. Workmen who were to come from Bohemia, Thuringia, and other sections of Germany found travel difficult or impossible. England, jealous of the expansion of Germany's glass-trade in America, had called upon the government of Hanover to frustrate Amelung's plans, and had even (according to some accounts) planned to capture the vessel upon which he and the majority of his artisans had sailed. Owing to a variety of circumstances, concerning the nature of which we can for the most part only conjecture, the New Bremen company found itself financially embarrassed after a few years of operation.

On May 26, 1790, Amelung presented a petition to the national House of Representatives, asking that

government patronage be given to the American glass-making industry. Mr. Whalley of Boston memorialized the legislature in the same cause. Charles Carroll had, in the previous year, moved that a duty be placed on imported window and other glass, with the exception of black bottles. His motion was successful, and a duty of ten per cent ad valorem was established. This was the first tariff act passed under our present Constitution. Amelung's petition of 1790 is also memorable, in that it was the occasion for the first consideration and decision by Congress of the policy of that body relative to bounties. The committee to whom the petition had been referred reported upon the matter June 30, 1790, recommending that the Secretary of the Treasury be authorized to grant Amelung a loan, not to exceed $8000, provided the company furnished satisfactory security for its reimbursement. In the ensuing debate in Congress several members strongly opposed the measure, on the ground that it would create an unwise and unsafe precedent. Others held that the individual States, rather than the national Government, should foster the industries within their borders; while still others doubted the constitutional power of Congress to authorize a loan of this nature. The measure was finally defeated.

After this, matters went from bad to worse at New Bremen. In 1795, Amelung offered for sale the glass-works and two thousand acres of land "with improvements," including thirty dwellings, warehouses, stables, etc. In a letter written in July of the following year, the Duc de la Rochefoucauld-Liancourt records a visit which he has just paid to "the glass manufactory near Frederick Towne, Md. (Proprietors from Bremen, Germany)," and remarks: "This manufacture has

shared the fate of almost all first establishments of this nature, and is so near its destruction that the latter may be considered as complete. There are now materials in Great abundance near the spot."

The New Bremen glass-works had attracted wide attention, especially throughout Pennsylvania, Maryland, and Virginia. Much was expected of it, and the course of events and circumstances which brought about its failure must have been unusual. We read of no fires—perhaps the most common form of disaster in our early glass-industry. Amelung and his associates must have lacked the ability to manage an industry of such proportions. Certainly it is unreasonable to suppose that there was no demand for the varied output. Glass-houses were few and far between in the years immediately following the Revolution; while the use of window, bottle, table, and chemical glass was increasing rapidly.

Such men as Washington, Jefferson, Franklin, John Adams, Charles Carroll, and Governor Mifflin were hopeful for the future of this industry. Writing to Thomas Jefferson, Washington remarked: "A factory of glass is established upon a large scale on the Monocacy near Frederick in Maryland. I am informed that it will produce this year glass of various kinds to the amount of three thousand pounds." It may be noted here that Amelung presented a glass service to Washington, journeying in person to Mount Vernon to deliver the gift. Two pieces of this set, large goblets of good flint-glass, were engraved with the Washington coat of arms. A number of pieces of Amelung's glass may be seen in the Masonic Lodge at Alexandria, Virginia, of which George Washington was the first Grand Master. Had I not known of its

real origin beforehand, I should have attributed the collection to the early period of Bakewell's of Pittsburgh. Many persons think the pieces English or Irish. The Holland Masonic Lodge Number Eight of New York city has similar pieces of New Bremen glassware—decanters, punch-glasses, and wine-glasses.

Beyond the above-mentioned and a few other authenticated pieces, about all that we know of the New Bremen output is to be gleaned or inferred from contemporary newspaper items. The "Maryland Journal and Baltimore Advertiser" of February 11, 1785, contains the following notice:

A Company of German Manufacturers, being lately arrived in the State of Maryland, and having made a plan of establishing a complete glass maufactory, in the United States of America, the present is to inform the Public, that said Glass Manufactory will consist in making all kinds of Glass-Wares, viz, Window-Glass, from the lowest to the finest sorts, white and green Bottles, Wine and other Drinking-Glasses, as also Optical Glasses, and Looking Glasses, finished complete . . .

As there is not the least doubt said plan will arrive in a short time to its full perfection, if assisted by the lawful power of the United States of America, and by means of the good advices of some gentlemen of this Country, the Public may be assured that what kind of Glass soever they may be in want of, their commissions given for them will be executed to their satisfaction, and afford at the most reasonable prices. In case any able Glass-Makers are willing to engage Themselves at this new growing and truly large and extensive Fabrick, on reasonable conditions, may find employment. All persons wishing to direct their orders to the Managers, are requested to direct them to the care of Messrs. Ludlow and Gould, New York, Messrs. Cox and Frazier, Philadelphia, Messrs. Crocketts and Harris, and Melcher, Keener, Balti-

more, Abraham Faw, Frederick Town, or to John Frederick Amelung and Co. at the Glass Works.

This same newspaper advertised that Amelung would make "Window glass, Engraved glass, Cut glass, Enameled glass, Looking glass, Bottles, Blown Table glass"; and on February 11, 1788, the following goods were announced as ready for sale: "½ gill to quart tumblers, ½ to 1 quart Decanters (exact measure), Wines, Goblets, Glass Cans with Handles, different sizes. Phials, assorted, Green bottles, pt. to gal. Useful glass ware Suitable for the assortment."

Fifteen months later, Amelung advertised as follows:

The subscriber having completed his glass manufactory near Frederick-Town in the State of Maryland, on an extensive plan, is now able to furnish Glass, not only sufficient for the Consumption of the State, but also in great Part for the neighboring States. He makes Window Glass, Transparent and substantial, equal to London Crown, an inferior quality equal to Bristol Crown, all kinds of Flint Glass, such as Decanters and Wine Glasses; Tumblers of all Sizes, and every other Sort of Table Glass. He also casts Devices, Cyphers, Coats of Arms, or any other Fancy Figures in Glass, and in a short time hopes to be able to furnish Looking Glasses of all Sizes. He takes the opportunity of returning his hearty and sincere Thanks to a patriotic Public for the Encouragement he has received in giving a Preference to the American Manufactured Glass and hopes by due Attention to merit a Continuance of their Favor.

For the Convenience of Gentlemen who wish to purchase Glass either by the small or large Quantities, the Subscriber has provided a Warehouse in Frederick-Town, for the Reception and Sale of his Glass, of which he has a large Quantity of all Kinds on Hand and has appointed Mr. Abraham Faw

his Agent, for the Sale thereof, who will dispose of the same as low as possible, in payment of which he will receive Cash, good Bills on Philadelphia, or Baltimore, or will Barter for assorted Merchandise, either in the Dry or Wet Good Line, or any Kind of Country Produce, and if required, will deliver Glass to any of the Sea-Port Towns in this or the neighboring States; and any Orders for Glass received by Mr. Faw, will be punctually attended to, and speedily executed, by the Public's obedient and humble Servant, John Frederick Amelung. New Bremen, May 16, 1789. N. B. The said Glass may also be had of Messrs. Thomas and Samuel Hollingsworth, Merchants, Baltimore.

Students of early American glass do not agree regarding the output of the Amelung undertaking. It should be remembered, however, that the works were probably operated for about six years. With experienced workmen in even larger numbers than were brought to Manheim, there is no logical reason to suppose that good flintware was not made at New Bremen. Indeed, it is possible that this house turned out as much and as good glass as did Stiegel.[1] While certain persons believe that only a crude form of bottle and cylinder glass was made by Amelung, others argue that his skilled German workmen must have brought to New Bremen every method of glass-manipulation, as practised in Germany and Bavaria at the close of the eighteenth century, and that a portion of the fine flint glassware accredited to Stiegel rightfully belongs to Amelung. Existing specimens said to be authenticated by

[1] During the debate of 1790 in Congress over the matter of a national loan to Amelung, Mr. Boudinot stated that he had seen the glass made at New Bremen and considered it "superior to any ever produced in America." In view of the fact that Stiegel's glass-making activities had preceded Amelung's, this opinion is of no little importance.

family tradition support the hypothesis that at New Bremen flint-glass was expanded from pattern or part-sized molds and insufflated glass made from four-section (not three-section) full-sized molds, and that Amelung not only made diamond-diapered bottles, salts, and bowls but was the first to introduce the insufflated method into America. Up to a year or two ago we heard nothing of the New Bremen factory. In time it may be given an equal prominence with Manheim and South Jersey. Comparatively speaking, Fredericktown and Manheim are so close to each other that the matter of locality in which a piece is found is in itself insufficient evidence to prove that the piece was made at one factory or the other.

Amelung has probably left us a limited heritage of very fine clear and colored flintware, engraved, enameled, and etched glass, along with coarser containers and other forms of hollow-ware. And by "limited" I mean perhaps two thousand extant examples scattered over the country, in collections, with as many more still uncovered.

CHAPTER XXIII

EARLY MASSACHUSETTS HOUSES

Charles F. Kupfer, a practical glass-maker, came to Boston from Brunswick, Germany, about 1785, and soon became acquainted with Robert Hewes, who had failed in his attempt to make glass at Temple, New Hampshire. Their meeting led to the formation of the Essex Glass Works. Plans were formulated whereby experienced artisans would be brought to America from Brunswick, and the most up-to-date improvements were to be installed in the factory. Kupfer sailed for Germany, but found it more difficult than he had anticipated to "entice" the Brunswick glass-workers to Boston. After considerable scheming, the party slipped over the border on a dark night, concealing their smaller tools in their clothing, and finally reached Massachusetts after a long voyage. As they entered the harbor at Boston they were greeted by a large crowd of enthusiasts, who formed a procession from Long Wharf, through State and Washington streets, to the works.

In 1787 the General Court of Massachusetts granted the company the exclusive privilege of glass-making in the State for a fifteen-year period. Those interested in the venture, besides Kupfer and Hewes, were Edward Payne, who was elected "Treasurer to the Proprietor of the Glass Company," Samuel Whalley, and Richard Hunnewell. Hewes became the manager, and Kupfer the superintendent, or "gaffer," of the works.

The factory stood on the corner of Essex and Kingston streets, near the present site of South Ferry Station. Hunnewell erected a wharf for the company's use. The sum of £42 was drawn from the general treasury, and additional workmen were sent for from southern New Jersey.

The first glass-house was pyramidal in shape, but its construction and form did not suit the Brunswick blowers. It was razed and immediately replaced by a spacious and properly constructed building, the outside of which was frame, the interior brick. The dimensions of the furnace room were one hundred feet in length by sixty feet in width. The making of glass in quantity did not get well under way until 1792. From the beginning of operations the firm met with success, and by 1798 the factory was producing as much as nine hundred sheets of cylinder-glass a week. The glass was advertised as "equal or superior to importations." It became a rival to the foreign output sent to America, and a demand from all parts of our country was created for Boston window-glass. At the beginning of the nineteenth century, this glass was being sold at $1.75 a sheet, the annual production amounting to $76,000.

In 1809 the firm was reorganized, and given the name Boston Crown Glass Company. In 1811 the new company, planning to increase production, started building operations on the South Boston Shore, expecting to man the new plant with a few of their best Essex Street workmen, augmented by foreigners. An agent was sent to England to recruit workers, but all plans were completely upset by the outbreak of the War of 1812. The operatives could not ship for America, supplies were cut off, orders were remanded, and both plants shut down. After the ending of hostilities,

the Essex Street factory was reopened, but the losses had been too severe for the management to overcome. They could not get back onto the old footing.

Samuel Gore, one of the firm, was a brother of Christopher Gore, a governor of the Commonwealth of Massachusetts. He had been a member of the Boston Tea-party in 1773. The other stockholders were men of equal determination. But it took more than determination to succeed in the glass business; outside forces were more powerful than the will of man. In 1815 the works was blown down in the great gale which swept the Atlantic seaboard, the buildings also taking fire from the wrecked furnaces.

In 1822 "large and extensive" buildings were put up on the South Boston property, and in 1824 the firm was enlarged and incorporated, the incorporators being Jonathan Hunnewell, Samuel Gore, Samuel G. Whalley, Henry G. Foster, and John S. Foster. The new board greatly interfered with the management, which had been in charge of Kupfer. Kupfer resigned, sold his shares of stock, and with Caleb G. Loring as partner established the mercantile glass-house of Kupfer & Loring, which in later years became successively Caleb G. Loring & Co., Tuttle & Gaffield, and Lambert Brothers. After Kupfer's withdrawal from the Boston Crown Glass Company, the firm went to the wall from lack of proper management and the tendency of its good workmen to migrate. Litigation between Hunnewell and Kupfer continued for a number of years, regarding the endorsement of certain old notes, Daniel Webster acting as Kupfer's counsel.

An interesting after-comment on the rise and fall of our earliest successful cylinder-glass works is found in a letter written by the son of Charles Kupfer. It is

dated Baden Baden, June 4, 1862, and in it the writer says: "The Duke's Royal Glass-works where my father went to steal away the first workmen for the Boston works, is still in operation."

The collector's interest in these two window-glass houses lies in the hollow-ware which it is assumed that the efficient workmen must have blown for their own and their friends' use. A number of such pieces must still survive in the vicinity of Boston, many of them evidencing the South Jersey type of "offhand" blown manipulation, some of the workmen having come from South Jersey.

The Boston Porcelain and Glass Manufacturing Company was granted a charter by the Massachusetts Legislature in 1787, but the works did not get under way until 1792. It was later incorporated under the laws of the State, February 4, 1814, being the third glass-factory to be incorporated in Massachusetts. This industry stands out in peculiar prominence because, although it was not a success under its earlier managements, it marked the beginnings of the New England Glass Co., one of the first really successful glass-houses in America.

The State realized the necessity of fostering manufacturing after the Revolution had left us destitute of domestic commodities. Production was imperative. There was a dearth of tableware of all kinds, and of window-glass. The company decided to make pottery, porcelain, and glassware. A six-pot furnace was built at Craigie's Point, East Cambridge; kilns for the pottery and porcelain were constructed; and a Mr. Thomson was engaged as manager. But, unfortunately, the management was not versed in the methods of manufac-

ture; there was lack of raw materials and of skilled workmen; and the venture failed.

The beginning of flint-glass making in Massachusetts was an outgrowth of the old Essex Glass Works in Boston. Among the artisans imported for the latter endeavor was a flint-glass expert named Thomas Caines, who prevailed upon the management to build a six-pot furnace for flint-glass in a corner of their Essex Street grounds. In 1812, when the embargo was in effect, this little furnace ran full time; but later in the face of foreign competition, it was compelled to shut down. Attempts were made in 1820 and 1840 to resume operations, but neither was successful.

In 1802 a window-glass house was built at Chelmsford, now Middlesex Village, on land which is at present included in the city of Lowell. The proprietors were Hunnewell & Gore, owners of the Essex Glass Works in Boston.

The furnace building, situated about two hundred rods from the Merrimac River, was 124 feet long and 62 feet wide; "with necessary appendages"—probably the pot-house and fuel-sheds. Adjacent to the factory the company erected a "two-storied house, handsomely furnished, designed for the residence of the overseer, and around it, at convenient distances, a number of smaller houses for the accommodation of the workmen and their families." Twenty families were installed in these homes, consisting of forty men, twenty women, and forty children. In 1820 the factory was in a flourishing condition, bottles and hollow-ware being produced in addition to window-glass.

The situation was favorable for transportation facili-

ties to Boston (this antedated the day of the railway). Fuel was close at hand and very cheap, two thousand cords being consumed annually at the factory and in the homes. An additional furnace had been erected prior to 1820, and the works in that year also included three flattening-ovens, two tempering-ovens, six ovens for drying wood; cutting, mixing, and pot rooms; a kiln for burning brick, a mill-house, and a sand-house. Everything was running on a satisfactory basis, when the firms in Boston in which Hunnewell and Gore were large stockholders failed, in 1827, necessitating the closing of the Chelmsford branch. On July 11 of the following year a portion of the plant burned to the ground.

A corporation, organized at the home of Simeon Spalding, immediately took over what was left of the plant, and rebuilt or repaired the buildings. Among those financially interested in the new company were William Adams, Daniel Richardson, Jesse Smith, and Amos Whiting, Jr., who acted as directors, and William Parker, who did not purchase an interest until 1829. This corporation manufactured window-glass and bottles for ten years, but did not use as good a grade of silica as had its predecessors. The fuel also is said to have been of inferior quality, the best of the adjacent timber for this purpose having been exhausted. In 1829 the stockholders decided to move the works across the border into the neighboring State of New Hampshire, where at a little village called Suncook, near Pembroke, they believed they would have the benefits of cheaper living conditions, more available and better fuel, and sand from Massabesic Pond, a body of water in close proximity to Pembroke.

The famous Lowell railway bottle is attributed to

this house under its second management. The Lowell "Success to the Railway" is a rather dull green flask, quite different in color and texture from the other eleven known varieties of this design. It falls in the horse-drawn classification of "Railroads." Plans for the use of horse-power on the new Boston and Lowell Railway were made in 1829, and it was but natural that this glass-house should seize upon the auspicious occasion and commemorate it upon a flask—as had been done at Coventry by Thomas Stebbins, at the opening of the Erie Canal, and during the visit of Lafayette to America in 1825.

Like the Ludlow and Chester factories, the Cheshire Crown Glass Works represented one of the earliest attempts to manufacture window-glass away from the Atlantic seaboard. The Cheshire furnaces were built in 1812, and operations began the following year. The company consisted of Captain David Brown, who provided the greater part of the capital, his two sons Darius and John, John D. Leland, and a man named Hunt. A peculiar circumstance connected with the Cheshire works was that, although it was built directly over one of the finest sand deposits in the world, the company was ignorant of this fact and hauled its silica for three miles, from the Lane sand-beds.

The enterprise is said to have failed after two years, owing to intemperance among the workmen. In the early nineties a day-book kept by Captain Brown during the brief period of operations fell into the hands of Mr. William G. Harding, the first person to collect and collate the fragmentary data concerning early glass-making in Massachusetts. As was the usual custom of those days, Captain Brown opened a general

store on the company's premises, and also built a distillery adjacent to the store and the glass-works. Tokens, or shinplasters, were issued by the company as payment to its employees; and these were accepted as currency at the store and distillery. It is said that the men spent more time and tokens at the latter than at the former. The tasks of fuel-stoking, glass-blowing, etc., were so devitalizing that the workers took easily to liquor, and intemperance became a paramount issue at many of the early glass-works. Captain Brown lost a considerable fortune in this venture.

The Franklin Glass Factory Company was incorporated under the laws of the State of Massachusetts on February 6, 1812. The stockholders in the undertaking were William Cobb, President; Ebenezer Hall, Superintendent; Jacob Rich, Samuel Fay, Ebenezer Williams, and Benjamin Tuel. Operations did not get under way until October of the following year, when cylinder-glass and hollow-ware were intermittently manufactured. After several set-backs, the original proprietors disposed of the plant in 1816 to a group of men consisting of Mark Moore, Richard Westcoat, Moses Daniels, Jonathan Blake, Jr., and Nathaniel Nickerson, William Cobb retaining an interest. By 1817 the works was abandoned and future attempts to revive glass-blowing at Warwick were unsuccessful. Few specimens of this hollow-ware are extant. The Memorial Hall at Deerfield, Massachusetts, owns an aquamarine fruit-jar and plate authenticated as a Franklin output. Besides aquamarine, deeper shades of green, amber, and olive-amber were occasionally used for a like purpose in the fashioning of these crude household articles.

The second incorporated glass-house in Massachusetts was the Adams Co. It was located in the town of Adams, Berkshire County, close by the great Berkshire sand-beds district. The date of incorporation was June 15, 1812, and the company was composed of John Whipple, James Mason, Daniel Shearman (or Sherman), and several others. It was a small cylinder-glass house, and our only concern regarding the output is with the "offhand" blown specimens which may have been produced by its workmen.

The Chester Glass Co., of Chester, Massachusetts, incorporated on June 7, 1814, is another of the numerous houses organized to make window-glass at the close of the War of 1812. Like the Adams factory, it was unfortunately of brief duration. Among the promoters of this luckless venture were Jesse Farrer, John Dewey, Charles Douglas, Benjamin Hastings, and D. and L. King. The works closed down in 1815.

The Farmers Glass Co. of Clarksburgh became the fifth incorporated industry of its kind in Massachusetts, being incorporated just two days after the Chester works—on June 9, 1814. Little is known concerning this short-lived factory other than that its sand was brought from Washington, Berkshire County, its clay for pot-making was hauled from Pennsylvania, and it erected a good-sized furnace and a row of workmen's cottages. The men interested financially in the venture were A. Southwick, John and Isaac Sherman, Rufus Darling, Ebenezer Pratt, and Daniel Aldrich. The furnace probably drew its fires in 1815.

A few authenticated "offhand" blown specimens of

glass are said to be in one or two glass collections in Massachusetts which have been handed down by the descendants of the Clarksburgh glass-blowers and kept in their families until within the last year or two. They are made of very light-green cylinder-glass.

Another attempt at glass-making in the State of Massachusetts was undertaken at the village of Ludlow, near Springfield. It is not known when or by whom the works was built. The land on which the glass-house stood was owned by various generations of the Sikes family, from the original land grant until after 1800. On June 15, 1815, the Ludlow Manufacturing Company became incorporated, being the sixth glass-house in Massachusetts to take out papers of incorporation. It is not known when or why the works was abandoned.

The Sikeses may have erected the works. From information given me by Mr. Walter A. Dyer, I find that it was one of the show-places of the day, these New England furnaces holding a peculiar fascination for the people in their vicinities. Glass-blowing has always been an interesting process, and the country people loved to watch the "ponderous furnaces and the sweating laborers." It is said that the workmen fell into evil ways, and neglected their pot-making, furnace-tending, and glass-blowing, to the detriment of production. However, the prevailing financial stringency probably had something to do with the drawing of the fires.

The Ludlow works was preëminently a green-bottle house, although glass in other forms is said to have been made. As was the general rule, the latter doubtless falls into the "offhand" blown classification.

The ruins of the abandoned Lenox Iron Furnace stand in the southern part of Lenox, Massachusetts. The iron-works was incorporated in 1848, and an adjacent furnace for window-glass was put into operation about 1853. The company was composed of Oliver Peck, William A. Phelps, and James Collins; and Hiram Pettee was engaged to superintend the glass-making. The latter was soon succeeded by his brother Seneca. The works burned almost immediately, but was rebuilt. The plant was operated at a heavy loss for two years, and closed down in the early part of 1855. In the fall of that year it was leased by James N. Richmond of Cheshire, who ran the factory until 1856, when it was again taken over by the Lenox Iron Company, who for six years following made a rather poor grade of plate-glass, instead of the window-glass which had constituted the previous output. The collector's only interest in the Lenox furnace is concerned with the very few pieces of "offhand" blown glass which may have been made there during the glass-blowers' leisure time.

CHAPTER XXIV

THE PITKIN, COVENTRY, AND OTHER CONNECTICUT HOUSES

THE earliest recorded glass-industry in Connecticut was established at Manchester by William and Elisha Pitkin and Samuel Bishop. While the province had granted a twenty-year privilege for glass-making to Thomas Darling, in 1747, it is believed that this patent lapsed without any production on Darling's part.

William Pitkin, the first of that name to come to the New World, left his home at Marlebone, England, and arrived at what is now Hartford, Connecticut, in 1659. The name of Pitkin has ever since been associated with the activities and progress of that section of the Connecticut Valley. Richard Pitkin, father of the glass-house promoters, was responsible for the grant or charter accorded his sons by the legislature: the permit for the erection of a glass-works at Manchester, with a monopoly of the industry for twenty-five years, was in the nature of a reward from the Government for the faithful services rendered his country by the elder Pitkin during the Revolution. Not only did Richard Pitkin give bountiful financial aid to the colonies in their struggle for liberty, but he manufactured a large quantity of gunpowder at a powder-mill in Manchester, which he distributed free of charge to the authorities in command of the army. Like the De Neufvilles, Pitkin sustained heavy financial loss by his generosity and patriotism; and it was "in compensa-

tion of their losses" that the Connecticut Legislature granted the glass-making charter to his sons.

The Pitkin Glass Works was the first to be built within the confines of the State of Connecticut. Erected in 1783, it is believed that it operated continuously until 1830. In 1810, J. P. Foster, who had been the superintendent of the industry, took over the active management of the house. For almost a half-century this bottle-works produced a steady flow of containers, many of which have never been surpassed in beauty of color and pattern. The finer types of bottles were naturally in the minority, yet enough of the Pitkin output has survived to have established a generic term in glass-collecting. The "Pitkin-type flask" is known to every American glass-collector.

During the construction of the works, the curious from far and wide congregated to watch the unusual operations. The erection of the furnaces was an especial novelty to the country-side. It was also a momentous event in the commercial and industrial history of the State. When the time arrived for the first firing, fusion, and blowing of the metal, people drove in from miles around to watch the peculiar procedure; and as many as could took home a bottle as a souvenir of the great occasion.

Trade soon became brisk at the new works. Providence and Salem commission agents gave large orders, consigning the merchandise to sailing-masters, with ports of call in China and the East and on the West India trade routes. Many of the large carboys and demijohns were shipped to the Barbados, where they were filled with rum and molasses and then re-shipped to our country.

The Pitkin company brought both its silica and its

head workmen from New Jersey. This accounts for the quality of the ware, and the esthetic superiority of even the Pitkin carboys over the glass bottles from many of our other early houses. Connecticut sand has always been below par, its impurities causing murkiness and streaks in the finished product. The Pitkin brothers also had the perspicacity to hire mold-designers of Dutch and German origin, who were versed in the now famous "half post" or German method of bottle-blowing, the ribbed, fluted, and expanded type of flask with the double-dipped body.[1] Boxes of goods were hauled by ox-team to Hartford, whence the containers were eventually distributed to all the routes of trade then open. Boon companion to the pioneer on his long trail to the Western Reserve, the Pitkin flask and its contents helped comfort many a surveyor and founder of the northeastern section of Ohio.

The Pitkin glass-house drew its fires in 1830, probably because of the lack of fuel; by that time the section was denuded of timber, and had become more or less agricultural. The old vine-clad stone ruins of the works have been preserved by a patriotic organization of which I am a member, and remain to-day one of the very few tangible evidences of our early American glass-houses.

Pitkin bottles range in size from containers two inches high to carboys holding from two to possibly four gallons. Many of the larger bottles of beautiful green color, with long banded necks to facilitate their

[1] The necks of these bottles were of one thickness of glass, the bodies were re-dipped into the metal, while being gathered on the blowpipe, thus attaining a superimposed or double thickness.

handling, were encased in a wicker covering plaited by the wives and children of the workers. A handle on each side of the almost elliptical casing made transportation easier while the casing still remained upon them. The finest carboy I have ever seen was a "Pitkin" in the home of Miss A. E. Carroll at East Hartford. The "Sunburst" pattern flask is particularly meritorious.

The larger-sized containers and the better grade of flasks retailed at from twenty cents to sixty cents each. Some of inferior grade or smaller size (probably snuff and ink bottles) brought twenty-nine cents per dozen.

Unquestionably, the Pitkin factory was among the first to employ the German technique in flask-making. The clear-glass types sometimes attributed to Pitkin are probably of early mid-Western origin. The true Pitkins are found in nearly every shade of green and amber, the sizes ranging in general from one pint to (more rarely) one half pint and (very rarely) one fourth pint.

A type of bottle believed to have been made only at Manchester is a golden-amber flask, of pint size, with corrugated sides and a straight somewhat expanded neck—as illustrated on page 134 of Van Rensselaer's book. The upper part of the sloping side bears a round medallion, with bull's-eyes or sun-burst decoration. The lower decoration resembles a pineapple or quilted design. It has been found in several variants of pattern. The name "Jared Spencer" is impressed on the medallion of one variant, the reverse medallion being stamped "Manchester Con."

John Mather of Parker Village erected a powder-mill and a small adjoining glass-house in 1808—the

year in which the quarter-century agreement of the State of Connecticut with the Pitkin family expired. Twelve men were employed in the operations of the two Mather factories. The powder-mill was run by hand-mortars, twelve kegs of powder of twenty-five pounds each being produced daily. Mather, who was the leading citizen of the village and an aristocrat on democratic soil, also owned the general store and other undertakings in the little town, and during the War of 1812 furnished ammunition to the Government.

Promptly at eleven o'clock each morning the boys apprenticed at the glass-works went to the general store to obtain the supply of food for the noon repast of all the workers—this custom, in the vernacular of the village, being called "dinnering the men."

Almost nothing is known about the output of Mather's glass-house, but it probably consisted of dark-green bottles. In 1830 the powder-mill was sold to Hazard Loomis & Bros., who soon became the powder monopolists of New England.

After the trade upheaval following the War of 1812, a group of patriotic Coventry citizens organized the Coventry Glass Works, a stock company for the erection of a bottle-works. Building operations started in 1813, but little is definitely known about the works until seven years later, when the business passed into the hands of Thomas Stebbins, a man of both artistic and practical ability. Stebbins probably introduced the method of insufflated-glass making into Connecticut; and his flasks are among the finest, in both design and metal, produced by American makers.

In 1830 the house became known as Stebbins & Chamberlain; while at a somewhat later period it was

operated by Gilbert, Turner & Co. The latter firm ran the plant until 1847, when the supply of wood for fuel gave out and the property was sold.

Nathaniel Root acted as the first agent for the works, which always specialized in snuff-jars and ink-wells. The sand used was a mixture of reddish and white silicas found in the vicinity, which was combined with wood-ashes and salt. The output also included large and small bottles, flasks of a historical and decorative nature, tumblers, and decanters. Elaborate "offhand" blown specimens were occasionally made, the authentication of which has been made possible by family tradition.

The Coventry colors were mainly various shades of green and amber, olive-green and olive-amber predominating. A brownish amber is also attributed to this house.

It is difficult to distinguish a portion of the Coventry from the contemporaneous Keene output, the corrugated-edged flasks and the geometric insufflated patterns being common to both houses. A rivalry existed between the two factories, each trying to undersell the other, and each attempting to produce a better grade of metal.

Thomas Stebbins may have been the first glass-house owner who adapted the portraits of well-known men to the whisky-flask. His "DeWitt Clinton" and "Lafayette" models were made, it is supposed, to celebrate the opening of the Erie Canal and the visit of the French hero to America in 1825. Clinton was Governor of the State of New York at this time. Several of the Coventry flasks are marked—some with the stamp "T.S.," while others bear the later initials "S & C."

The New London Glass Company of New London was organized August 27, 1856, and capitalized for $12,000. N. S. Perkins, Jr., was president of the company; Lorenzo Hodsden acted as secretary and treasurer. It is probable that actual operations did not get under way until some time later. In 1859 the concern used the trade-name of the Union Glass Co., the factory being then owned by Warren & Co. There is almost no mention of this industry in the various histories and records dealing with New London in the middle of the last century, and after a fruitless search I am forced to conclude that it ran for only a few years and that the output was negligible. It would seem that, in 1865, N. S. Fish leased and operated the business, under the name of the Thames River Glass Company, and that later he and William Batty bought the property, which was finally disposed of to the Ellenville, New York, glass interests.

A small output of flasks of rather poor-grade glass was made. These flasks have no outstanding merit, being similar in pattern to bottles made during the same period at Lockport, Ravenna, the Arsenal works at Pittsburgh, and the Spring Garden works at Baltimore. Two varieties which are marked are found in pint and half-pint sizes; their mouths may be straight, collared, or double-collared; their bases are generally scarred; the colors are aquamarine, amber, olive-amber, medium green, and deep green. Their designs are as follows:

Type I Obverse: "New London" on ribband above, "Glass Works" on ribband below, a large anchor and rope. Reverse: Eagle, head to left, perched on wreath; nine stars above eagle's head.

Type II Obverse: Same as Type I. Reverse: Bird in flight, surrounded by seven stars.

Thirteen shareholders contributing a capital stock of $18,000, organized the company which built the Westford Glass Works, in 1857. After the close of the Civil War the factory was taken over by the E. A. Buck & Co. interests, who ran it successfully as a black and green bottle house until 1873. George Foster also had an interest in the works after the war.

The output consisted mainly of heavy, coarse bottles, very similar to those made at West Willington—which is not surprising, for it is said that both these houses, which were for part of the time under the same management, used Connecticut sand, and many of their molds were interchangeable. It is impossible to differentiate a part of the production of these factories. Westford used the "Eagle, Sheaf of Grain" and "Five-pointed Star" among its designs on flasks.

In 1815, Abiel Johnson and several associates erected a bottle works at West Willington which soon became the leading industry of the town. The metal was dark and coarse, streaks, caused from impurities in the sand, frequently running half of the length of a flask. The demijohns were incased in wickerwork, but unlike those from the majority of houses, the stoppers were also covered with wicker.

Gilbert Turner & Co., who were running the Coventry works in 1830, became interested in this factory operating it under the trade-name of the Willington Glass Company. Other stockholders under the Turner management were R. B. Chamberlin, Elisha Johnson, and Gilbert Turner. This group of owners sold their

interests to a company composed of Harvey Merrick, Elisha Carpenter, William Still, James McFarlane, and William and Frank Shaffer, in April, 1847. George Foster of Stoddard fame was also a part-owner of the house at one time.

This large industry ran successfully until 1872, the constant output of bottles, apothecary-jars, ink-wells, pickle-bottles, snuff-jars, and jam-jars being prolific. Better silica was used by the firm in the latter years of its operation. At this period the colors ranged from olive, olive-amber, dull green, sage-green, to light green, amber, and aquamarine. "Offhand" lamps, bowls, tumblers, and other articles were blown by the workmen.

The history of the Connecticut glass-houses is unique in that the various factories are not known to have made any commercial output of window-glass, table-glass, or clear glass.

Mr. Frank MacCarthy, who has been intimately associated with the glass-production of Connecticut, writes:

> It is a certainty that there are plates, candlesticks, and bowls which came from Connecticut glass houses, but they were made by the workmen for use in their own homes or as gifts for relatives or friends. I have never known of a pitcher which anyone could definitely assert was of Connecticut origin.

These industries, concerning whose operations so little is recorded, made all sorts of containers—and little else. They manufactured bottles of all sizes for all sorts of wines and alcoholic drinks, ink-wells (some of real beauty), snuff canisters or jars, bottles for

molasses and for liquid shoe-blacking. "Black ink for Quill and Gold Pens" was widely advertised in this section; the ink-bottles are of many forms and patterns, the most interesting being the amber octagonal and the insufflated geometrical-patterned amber and olive types, the latter probably a Coventry output. Shoe-blacking, which sold in large quantity, was put up in four-sided bottles from five to six inches in height, like the snuff-jars with a straight mouth and a scarred base. According to Mr. S. H. Williams of Glastonbury, Connecticut, whose family made many of these interesting containers, blacking was in special demand for soldiers' boots during the Mexican and Civil wars.

The Connecticut containers run the color scheme of all the olives, ambers, and greens, but stay within the confines of these shades. The Pitkin and the Coventry output was esthetically superior to that of many of our other bottle-houses, both contemporary and of a later period.

CHAPTER XXV

ALBERT GALLATIN AND THE KRAMERS

Albert Gallatin, famous as scholar, legislator, diplomat, and financier, was born in Geneva, Switzerland, on January 29, 1761. Orphaned at the age of nine, the boy nevertheless received an excellent education under the supervision of a friend of the family; but on April 1, 1780, he and a companion secretly left home and sailed for America. They landed at Cape Ann, and from Gloucester rode on horseback into Boston. Here, at a tavern, they met a former countryman, who was the means of inducing young Gallatin to go to the northeastern coast of Maine, a bleak frontier, where he purchased a tract of land and remained until 1781. During the latter part of the Revolution, he served in various capacities under Colonel John Allen, in November, 1780, being left in charge of an earthworks near Passamaquoddy. Gallatin returned to Boston in the fall of 1782, and taught the French language at Harvard College until 1783. He then went to Philadelphia.

The Ohio Land Company, formed by Thomas Lee, Lawrence Washington, and George Washington, to populate and exploit the fertile territory on the banks of the Ohio River and many of her tributaries, was at this time drawing an ever increasing number of young ex-officers and soldiers of the Revolution westward. On the advice of Patrick Henry, whom Gallatin met in Richmond, the latter started for this new country

in 1784, upon his arrival selecting a tract at the junction of the Monongahela River and George's Creek, about four miles north of the Virginia line. Here he built a log cabin, and in September, 1784, entertained George Washington, giving his former commander-in-chief the one bed in the cabin, while he slept on the floor.

Gallatin spent the winters of 1784–85 in the cultured society of Richmond, returning to the frontier in the spring. In October, 1785, he took the "oath of allegiance and fidelity to the Commonwealth of Virginia." Although his cabin stood within the limits of Pennsylvania, Gallatin spent most of his time over the border line in the old Dominion State. In 1786 he purchased an additional acreage of wild, picturesque, hilly land overlooking the river. Here he built "Friendship Hill," and around this mansion-house the settlement of New Geneva took form. Across the Monongahela lay the village of Greensboro.

Gallatin's first wife, Sophia Alligré of Richmond, lived but a few weeks after he brought her as a bride to Friendship Hill in 1789. Four years later he married Hannah Nicholson of Philadelphia, whose father, Commodore James Nicholson, had been captain of America's first frigate, the *Trumbull*. The commodore's son, young James Witter Nicholson, had come West with Gallatin, helping him start a glass-house and a gun-factory at New Geneva.

When the New Bremen glass community came to grief toward the close of the eighteenth century, certain members of the Gabler and Kramer families, which had intermarried, decided to go West and open a glass-works at Louisville, then a prosperous town in

Kentucky. In company with several other glass-blowers, they started out to walk over the long wilderness trail from Maryland to Wheeling. Stopping at Tomlinson's Tavern in Wheeling, whence they expected to proceed by boat down the Ohio to Louisville, they accidentally met Albert Gallatin, a guest at the inn, whereupon, discovering a common interest in glass-making, they talked "till dawn broke, with this well groomed and polished stranger, a man of the world, who at the same time spoke their language." Gallatin dissuaded them from going farther, and induced them to accompany him to New Geneva, to operate his glass-furnace, which was probably then in course of construction. The names of the glass-blowers were John Gabler, Adolph Eberhart, George Reppert, Lewis Reitz, Baltzer Kramer, and Christian Kramer.

Three sides of the New Geneva glass-house were built of wood, the fourth of stone; the dimensions were only forty by forty feet, and the pots were so small that one man could lift them. The works were about three quarters of a mile from George's Creek, where the adjacent forests supplied cheap fuel and the wood-ashes that were used in the mix instead of soda. The furnace was ready for blasting in the spring of 1797. It was surrounded by cabins for the workmen's families, who came from Maryland to their new home. The output soon averaged 4000 boxes of window-glass annually, valued at $16,000, besides bottles and other hollow-ware.

The first run of glass occurred during Gallatin's absence, the Kramers superintending operations. The industry was known as Gallatin & Co. and Gallatin & Nicholson, but Gallatin had nothing to do with the

actual management. On May 8, 1801, the "Pittsburgh Gazette" contained the following: "On the 30th of April ALBERT GALLATIN Esq. left New-Geneva for the City of Washington, to take charge of the Treasury Department of the United States, of which he has been appointed Secretary, by President Jefferson." After this, Gallatin spent less and less time at New Geneva. In 1803 he decided to dispose of his interests there, and in the "Tree of Liberty" (the old "Pittsburgh Gazette" under a new name) for May 7 of that year we find the following advertisement:

SALE BY AUCTION

for the Purpose of Closing the Business of the Late Copartnership of

ALBERT GALLATIN & CO.

will be sold on the premises, and to the highest bidder, on the 20th day of May—All the valuable real property, lying on Monongahela river and George's creek adjoining the Town of New-Geneva belonging to the said Copartnership, consisting of about Six Hundred Acres of Land and including an excellent Merchant *grist mill*, two Saw *mills*, and a Boring *mill*. —Another valuable unimproved Mill seat at the mouth of the creek. One undivided half of the

NEW-GENEVA GLASS WORKS,

a Ferry across the Monongahela river, and Sundry Lots and Dwelling Houses in the Town of New-Geneva—Also, several Lots in the Town of Greensburgh, opposite New-Geneva, and some of the Lots adjoining the same.

Signed

ALBERT GALLATIN
JAMES NICHOLSON.

The glass-house was bid in by the Kramers, John Gabler, George Reppert, and Adolph Eberhart. They discontinued cylinder-glass making, henceforth blowing bottle-glass. In 1807 or 1817 they dismantled the old furnace, and erected a new one across the river in the outskirts of Greensboro, retaining the name of New Geneva Glass Works, and thereafter referring to the Fayette County house as the "old works" and the Green County house as the "Glass Works Farm." They installed a lime-flint furnace and a bottle-glass furnace and, I believe, began to make some of the finest early blown glass in America, undoubtedly also turning out large numbers of beautiful colored pocket-flasks of the expanded chestnut types. Greensboro was probably a home of the amber "Grandfather's Flask" —the large, ridged, and rather flat bottle which is so beautiful and rare, and which is found near this district. I am also of the opinion; that this Greensboro house made citron, amber, green, cobalt, and purple expanded bowls, salts, and pitchers, from pattern-molds, including swirled-and-fluted types. This fine blown glass should not be called "Gallatin" or "Nicholson," for ninety-nine hundredths of it was produced after Gallatin and Nicholson left the concern. It should be referred to, when properly authenticated, as "Greensboro" or "Kramer family" glass.

Christian Kramer was born in Germany in 1773, and died in Green County, Pennsylvania, in 1858—the last, it is thought, of the New Bremen artisans who came to America with Amelung. He probably knew more about glass-making than Amelung himself, and I believe the day will come when he will be ranked above the Wistars and almost as an equal with Stiegel. Much of the glass attributed to Stiegel was

made by such artisans as the Kramers, Repperts, Kimbers, and Gablers—the last-named, it appears, being of both South Jersey and Maryland glass-house affiliations.

Christian Kramer married Catherine Reppert, John Gabler married Sophia Kramer, and Thomas, their son, married Wilhemina Kramer. Thomas Gabler and his son Allan later became two of the finest glass technicians in the Pittsburgh district. Young George Reppert, son of George and nephew of Christian, developed the same glass-blowing ability. He was a cousin of the Repperts who went to Baltimore.

CHAPTER XXVI

O'HARA & CRAIG OF PITTSBURGH

James O'Hara, an outstanding figure in the early life of Pittsburgh, was one of the great group of young Scotch-Irish pioneers who materially helped to open up western Pennsylvania, Virginia, and southeastern Ohio. He arrived in the colonies during the decade of 1760-70. Adventure beckoning his restless spirit, he went to Fort Pitt in 1773, becoming an Indian interpreter and trader and familiarizing himself with the aboriginal dialects and customs. In his barter with the Indians he never aroused their enmity. At the outbreak of the Revolution he enlisted as a private in the Ninth Virginia Regiment. He was promoted to a captaincy, and later was made assistant quartermaster.

After peace had been declared, O'Hara became a presidential elector from his district, casting his first vote for his commander-in-chief, George Washington. Later, he was commissioned Quartermaster-General of the United States Army, and served in Anthony Wayne's and other campaigns with his usual remarkable ability. He took an active part in the Battle of Fallen Timbers in 1795, which was followed by the celebrated Treaty of Greenville.

The story of this man's courageous overcoming of difficulties, especially in the matter of supplying our frontier forts, settlements, and armies with salt, food,

clothing, and powder, is very interesting. Incidentally, he founded one of the greatest landed estates in America (the Schenley), through his purchase of large tracts from John Penn, Jr., in 1784, supplemented by grants of thousands of acres in Wayne County, which extended through parts of what are now Ohio, Indiana, and Illinois, up into Wisconsin. O'Hara died land-poor, but his descendants and the city of Pittsburgh have been enriched by his purchases.

In 1796, O'Hara decided to engage in the manufacturing business. The adjacent settlements were growing; a steady influx of pioneers from the East demanded window-glass for their homes, hollow-ware for their tables and taverns, and flasks for their pockets. Accordingly, a partnership was formed between General James O'Hara and Major Isaac Craig for the erection of a glass-works. Craig failed in his effort to find a coal-bank and an adjacent site for the enterprise on a run at the upper end of Allegheny City. He then bought a strip of land from Ephraim Jones, just below Jones's Ferry, on the south side, at a point below the spot where the old bridge terminated and opposite the confluence of the Allegheny and Monongahela rivers.

O'Hara was absent the greater part of 1796 and 1797, his duties as quartermaster-general keeping him in Detroit and elsewhere; but Craig went ahead with the plans, and on June 12, 1797, wrote to his partner, then near Detroit: "I have purchased Ward's coal pits from one Ephraim Jones . . . also a house and lot near the Spring." This purchase is an outstanding event in the history of American glass-making, for "Coal Hill" (a part of the property) provided the first coal used in our glass-furnaces.

Deciding to engage an experienced person to oversee the building and operating of the works, O'Hara went to Philadelphia, where he hired William Peter Eichbaum, then superintendent of the Schuylkill River Glass Works. The two returned to Pittsburgh, traveling the long way on foot.

The first furnace was constructed for cylinder and bottle glass making, and held eight pots, with a capacity equal to three boxes to the blowing. The first run of glass was probably made early in 1798. The concern was soon turning out three hundred square feet of window-glass daily, becoming the forerunner of the great Pittsburgh plate-glass industry. Bottles, from small apothecary containers to eight-gallon carboys, were blown; and in addition the early output included flasks of pint and quart sizes, hollow-ware, such as bowls, milk-pans, and pitchers, tavern-keeper's supplies, and a few clock-glasses. The gallon-size bottles wholesaled at $4.00 a dozen, and the quart size at $1.60 a dozen.

A French emigré named LaFleur (or Falure) went to work for the firm about 1802. This experienced man helped materially to build up the trade for O'Hara & Craig. He was later drowned in the Ohio River, when he attempted to ford the stream at Gravel Bar, below the Point, almost immediately in front of the glass-works.

Considerable difficulty was met with in getting enough competent hands to operate the factory, and this shortage of glass-blowers handicapped the plant for eight or ten years, until the westward migration of glassmen from Maryland, South Jersey and Philadelphia began in earnest. A great influx of workers then made their way to this new industrial center.

O'Hara & Craig of Pittsburgh

Before Eichbaum's trip over the Alleghanies, samples of clay adjacent to the factory site had been sent to him for testing purposes. He reported that "they do not look amiss, with the exception of some roots." Between twenty and twenty-five tons of this clay had been dug and placed to ripen, according to Eichbaum's written instructions, to be used later in pot-construction. But the clay failed to meet expectations, and a better quality had to be carted by ox-team over the steep mountain trail all the way from New Jersey. On July 2, 1802, the firm advertised in the "Pittsburgh Gazette" as follows:

ONE HUNDRED DOLLARS REWARD

Will be given for the first Discovery of a bed or bank of Clay fit to answer the purpose of making Melting Pots for the Pittsburgh Glass Works, within one hundred miles of this place on the Monongahela, Allegheny, and Ohio rivers, and within ten miles of either river, to be determined by the Glass-makers, the Clay for this purpose is found in the beds of rivers or creeks, or in low lands, the best color is white, though white mixt with red or blue stripes will answer the purpose. Any person producing a specimen that will stand well in the fire and the bed from whence it came appearing to contain fifty tons, shall be entitled to the above Reward from the proprietors of the Glass works.

O'Hara & Craig.

Pittsburgh, May 20, 1802.

A generous price was given for potash, Eichbaum advertising in 1798 that he would pay upon delivery "1 shilling per bushel for wood ashes." On November 16, 1803, the "Pittsburgh Gazette" carried the following notice:

POT ASH

A liberal price will always be given for
Pot Ash
Pearl Ash or
Alkaline Salts
and particular encouragement to such as are inclined to establish manufactories of this article.

James O'Hara
Isaac Craig.

The adjoining coal-bank made it possible for this glass-house to survive in the face of the high cost of certain operations. The hills of fuel which nature conveniently provided at an opportune time for these industries was the salvation of the Pittsburgh manufacturers during the periodical waves of depression which hit the country.

The estimated cost of the O'Hara works for property, buildings, materials, and labor, before the first melt was attempted, was $30,000—as Craig stated it, "Today we made the first bottle at a cost of $30,000." European workmen were sent for in 1799 and in 1801, with a view to increasing and improving the output by adding a flint-furnace to the works. In 1800 the "Gazette" published an advertisement which affords a general idea of the factory's production:

The Proprietors of the Pittsburgh Glass Works, having procured a sufficient number of the most approved European Glass manufacturers, and having on hand a large stock of the best materials, on which their workmen are now employed, have the pleasure of assuring the public, that window-glass of a superior quality and of any size from 7x9, to 8x24 inches, carefully packed in boxes containing 100 feet each, may be had at the shortest notice. Glass of large sizes, for other

purposes may also be had, such as for pictures, coach glasses, clock faces, &. Bottles of all kinds of any quantity may also be had, together with pocket flasks, pickling jars, apothecary's shop furniture or other hollow ware, the whole at least 25 per cent lower than articles of the same quality brought from any sea port in the United States. A liberal allowance will be made on sale of large quantities. Orders from merchants and others will be punctually attended to on application to

JAMES O'HARA
or
ISAAC CRAIG

or the Store of Prather & Smiley
Market Street, Pittsburgh.

William Price of Stourbridge, England, was hired by O'Hara & Craig, at a considerable sum, to come to Pittsburgh for the purpose of supervising flint-glass making. He had been highly recommended to the firm, but for some unknown reason he seems to have proved a flat failure. The flint-glass furnace was built in 1802.

Jars, decanters, tumblers, and blue glass were advertised in 1803. It has been argued that neither decanters nor tumblers were made by the firm out of green bottle-glass, but Isaac Craig—probably a grandson of the founder—has stated to Joseph D. Weeks that green decanters (known in the factory as "big-bellied bottles") were made from the "corner-pots" of the window-glass houses even later than 1837, and that he "recollects distinctly seeing both tumblers and decanters made of green glass." Decanters were then used by the poor as well as the rich, and the poor could not afford the imported cut-glass articles. "Sometimes these green glass bottles were ornamented with beads around the neck."

There are persons who believe that O'Hara & Craig

did not make good flint-glass—that the furnace was contemplated but never erected. The matter is controversial. On two different occasions I went through thirty-four industrial histories, almanacs, records, town histories, and articles in the Carnegie Library of Pittsburgh, finding the preponderance of opinion to be that the firm actually built the furnace and made a small amount of flintware.

The O'Hara-Craig works announced on August 5, 1803, that during the preceding blast, which had begun in January and continued for six months, an average of thirty boxes a week of excellent window-glass, besides bottles and hollow-ware to the amount of one third the value of the window-glass, had been blown. The following price-list was advertised by the house in 1804:

Window Glass 7 by 9	at 11	dollars	a box
8 by 10	12		do
10 by 12	13		do
Gallon Bottles	400	cents	a dozen
Half Gallon do.	240		do
Quart do.	160		do
Pint do.	120		do
Porter and Claret do.	133 1/3		do
Pitchers, Half Gallon	400		do
Quart	300		do
Jars, Gallon	490		do
Half Gallon	300		do
Quart	200		do
Pint	133 1/3		do

Glass of a large size may be had on a short notice at a proportionable advanced price.

Craig, who was more of a promoter than a glass-manufacturer, disposed of his interests in the concern

in 1804, and went westward to open other glass-works. Notice of his dissolution of partnership with O'Hara was printed in the "Pittsburgh Gazette" of September 28, 1804. O'Hara's business activities became more and more diverted to other channels. He was one of the first directors, and later the president, of the Bank of Pennsylvania, established in 1804, the first banking institution in the West; he also established an iron-works at Ligonier. Eichbaum and an expert German glass-blower named Wendt took over the entire management of the glass-works, the concern being frequently known as Eichbaum, Wendt & Co. Wendt may have purchased the Craig interests.

The stagnation of trade during and following the War of 1812 almost wrecked this house. O'Hara was obliged to turn to a friend, James Ross, for loans, Ross's generosity being the only thing which tided O'Hara over the depression and saved more than one present-day public institution for the city of Pittsburgh. O'Hara died at his home on December 21, 1819. It was said that "the tears of the rich and the poor of the entire town fell upon his grave."

We do not know if what was termed "The Glass House Riffle" (or "Ripple") was a real or a mythical industry. If it actually existed, then Scott's, as it is said to have been sometimes called, was the first glass-house west of the Alleghany divide, and not O'Hara and Craig's enterprise. So many questions have been raised concerning this furnace that one does not feel like taking an arbitrary stand in the matter; yet it is likely that a glass-works was built in Manchester in 1793 or 1795, running for only a few years.

The "Riffle" is variously recorded as being situ-

ated on the north bank of the Ohio River and the west bank of the Monongahela River. Someone is in error. The Frenchman LaFleur is said to have come to America at Scott's request, to superintend the plant. We know that both these men were later associated with other glass-houses.

William McCully, in an interview with George Thurston the historian, stated in 1856 that Scott's was located in the Manchester district, not far from the O'Hara location; and that the furnace had an eight-pot capacity, turning out three boxes of cylinder-glass to the blowing. Thurston says that William McCully was very decided in these statements. However, Mark Watson, McCully's son-in-law and successor in the glass-business, authorized Joseph D. Weeks to state emphatically in the latter's census report of 1884 that McCully always spoke of O'Hara & Craig's as being the first glass-house in the Pittsburgh district.

CHAPTER XXVII

THE SECOND NEW JERSEY GROUP

Until the last few years every smoky-brown and green standing cup or mortar and pestle, every amber or blue bowl with a tooled superimposed decoration, every pitcher with plastically applied thread about its neck, was called "Wistarberg." A little later "Glassboro" was admitted into the precious fraternity; but we now know that the greater part of these types of glass made in New Jersey was blown by workmen employed in the glass-works of this State's nineteenth-century industries. In a way, it is pleasing to realize that the Wistars, father and son, did not have a monopoly on this very engaging glass, just as it is satisfying to know that as lovely Jacony baskets were produced by the Cambridge company as by the Stiegel furnaces.

Regarding the South Jersey group of industries, Mr. George S. McKearin writes:

With the more general term of *South Jersey*, we are treading on firmer ground: firmer, first, because the term is general, indicating a type of glass instead of examples of the product of one factory which ceased to exist at such an early date that attribution, based on family history, becomes in ninety-nine cases out of one hundred an attempt to weave the fabric of identification to the pattern of one's own desire; and, secondly, because the general term applies to the product of a large number of factories scattered throughout a certain

section or district, operating, probably, with a continual interchanging of workmen and handing down of methods from father to son and grandson, so that, for generations, the same general shapes, colors, and decorative features were produced almost unaltered, though they were eventually modified more or less in keeping with the commercial glass, china, and metal ware of the day.

In the third place, we are on firmer ground because these factories came into being many years after Caspar Wistar's day. In like manner, they were engaged in the manufacture of window-glass, or, as with most of them, of bottles, whiskey flasks, snuff jars, medicine phials, and such. Bowls, pitchers, mugs, and similar articles were not a commercial product, but were individually blown pieces, frequently, in fact, generally, cherished and handed down in the families of the workmen who made them, or of the friends or relatives for whom they were made. Consequently, they remained, as a rule, in the vicinity of the particular factory where they were produced, traveling only as the occasional family was uprooted from its native soil.

When these families *were* uprooted, they showed a marked tendency to settle farther westward in more or less isolated communities, keeping themselves sequestered in small towns or villages, which were in effect transplanted settlements of New Jersey, Pennsylvania, or Connecticut. They intermarried, held to their former faiths and to many of their social customs, and retained their provincialisms of manner and of speech; until, to-day, one may go into these various sections and find the third generation still retaining their old pewter, their chests, their homespun, their pottery, and their glass.

The Census Report of 1840 records the existence of twenty-eight glass-houses and four glass-cutting establishments in New Jersey at that time. These concerns employed 1075 workers, and their output for

the year was valued at $900,000. By 1869 there were forty-two glass-houses in the State, ten of which were at or near Millville and four each at Glassboro and Winslow.

The New Jersey factories dealt with in this chapter were, *almost without exception*, incidental producers of what we now call the "South Jersey type" of glass. Their owners, attempting to meet the commercial demand for window and door panes, clock and mirror glass, druggists' phials, and whisky-flasks, could never have dreamed that the "offhand" production of their blowers would cause their names to be recorded in the pages of a glass-collector's manual.

Records disagree regarding the early history of the window-glass works at Port Elizabeth, Cumberland County. It seems probable, however, that the factory was erected between 1799 and 1801 by James Lee and several Philadelphians. Lee managed the works until 1810, when a three-fourths interest in the house was disposed of to James Josiah, Samuel Parish, and Joseph L. Lewis & Co., for $10,000. Lee continued as manager for five more years, when Joseph Lewis and Jacob C. Wyckoff bought the remaining one-fourth interest for $7000. There was an understanding in 1810 that the Josiah-Parish-Lewis partnership was to remain intact for a period of seven years. Numerous changes occurred, however, and at the end of seven years the factory was being operated by J. Josiah, Harrison & Co., with Joshua Brick and Jacob C. Wyckoff as silent partners, the trade-name of the house being the Eagle Glass Works.

From 1815 the business declined, and it was decided to liquidate the enterprise, the other shareholders sign-

ing away their interests to Wyckoff for twenty dollars each. Wyckoff then wound up the concern. In 1818 the property was sold to Samuel P. Wetherell of Philadelphia, who gave $3000 for the buildings, grounds, and good-will of the Eagle company. Wetherell then rented the place to a group of German glass-blowers, organized by three brothers—Joseph, Johann, and Christopher Getzinger. The latter operated the works as lessees until the early part of 1831, when they purchased it from Wetherell for $4000; they then ran the factory as owners until 1846.

Under the Getzinger management considerable hollow-ware was blown, although the house was primarily operated as a window-glass works. It turned out a large number of flasks of the earlier types and much tableware, this output being often accredited to Wistar or to Stiegel, because of its blending of certain German traditions with the South Jersey technique.

The Getzingers disposed of the factory on February 6, 1846, to George B. Cooper and Charles Townsend. In 1850, Townsend withdrew, and the plant passed through a number of vicissitudes until sold at sheriff's sale April 30, 1862. The property then passed into the hands of Samuel Townsend, was operated by Mitchell & Irwin, then closed down and remained idle until John Focer (probably a Stanger descendant) again opened up the factory. It was abandoned in 1885.

A small glass-furnace was erected west of the road from Port Elizabeth to Millville a few years after the Eagle works was built, and under the name Union Glass Factory was owned and operated intermittently by men connected with the Eagle. Frederick Stanger,

his cousin Jacob Stanger, and William Shough established the new house, selling a one-fourth interest to Randall Marshall on June 6, 1811. The business was continued until November 5, 1814, when Joshua Brick, Isaac Townsend, and Stephen Willis were appointed by the court to divide the property into four equal shares. Randall Marshall then moved one of the furnaces to Marshallville, a village on the Tuckahoe River about twelve miles distant. The main factory fell into disuse, and was burned down a few years later. In connection with the ever expanding Stanger relationship, it may be noted here that Marshall's daughter Ann was the wife of Frederick Stanger.

At the beginning of the nineteenth century, Jonathan Haines built a glass-works at Clementon, Camden County. While little that is authentic can be ascertained regarding the output, it has been stated upon competent authority that the practice was to blow cylinder-glass for a certain length of time, and then alternate by blowing bottles for another period. William Stanger was the manager. About 1820 the property was sold to Samuel Clement and partners, who operated it as a window-glass works until about 1825. It was known as Clement's Glass Works in 1822.

The first glass-works at Millville was erected in 1806 by James Lee and his associates. This became one of the oldest houses in the country in point of years of operation. The factory passed successively into the hands of Gideon Smith, Nathaniel Solomon, and the firm of Burgin, Wood, & Pearsall; until 1828, when William Coffin, Jr., became associated with the ownership. The glass-house under his management was

known by the trade-name of Coffin, Pearsall & Co. Scattergood, Haverstick & Co. were the next owners, and they in turn sold to the Whitall brothers in 1844. In 1849 the business was known as Whitall Bros. & Co., eight years later becoming Whitall, Tatum & Co.

The manufactory in the decade following 1820 included two good-sized furnaces, one holding seven pots, the other eight. It was a bottle-factory, turning out carboys and demijohns, vials, snuff-bottles, and glass in demand by chemists, druggists, and physicians. The earlier bottles were blown into clay molds, which were later superseded by cast-iron molds. The house did a large business, and in 1880 was running four green-hollow-ware and six white-glass furnaces. It has now been proved by family tradition that a considerable amount of glass formerly classified as Wistarberg was made at this Millville works.

In 1814, Christian L. Stanger and several other German-American glassmen built a bottle-glass factory at Malaga, Gloucester (now Atlantic) County, a village not far distant from Gloucester. In 1820 it was purchased by Daniel H. Miller, one of South Jersey's prominent glass-promoters, and under his ownership was known as the Franklin Glass Works.

Miller operated the house for nine years, disposing of it in 1829 to John G. Rosenbaum. From 1830 to 1860, Rosenbaum and the Whitney brothers ran the industry, turning out a large quantity of bottles and hollow-ware. The works was closed down in 1860, after the death of Rosenbaum. The following year the heirs of Rosenbaum added another good-sized furnace room, and began to make window-glass exclusively.

Little is known regarding the early output, other

than that it conformed to the traditions created by the Wistars and carried on by the Stangers.

In 1812, William Coffin, Sr., moved from Greenbank to Galloway Township, Gloucester County, where he built a sawmill in the heart of a large tract of timber. In 1814 he purchased 1598 acres, and in 1817 or 1820 erected a cylinder-glass furnace. The settlement thus created was called Hammonton. Jonathan Haines, who had previously operated a small glass-house at Clementon, embarked in the business with Coffin, but soon sold his share to the latter, who ran the factory alone until 1836, turning out a large quantity of window-glass. In that year, his son Bodine Coffin, and his son-in-law Andrew K. Hay, took over the active management, turning the plant into a whisky-flask factory. A fate which met nearly every early glass-house befell the Coffin & Hay works in 1838, when it burned to the ground.

After the Hammonton Glass Works was rebuilt, William Coffin again assumed charge of the industry, making only window-glass. Upon his death in 1844 the property was taken over by two other sons, John Hammonton Coffin and Edwin Winslow Coffin. In 1851, Edwin sold out to John, who operated the works successfully until 1857, when trade conditions made it necessary to close down.

Bodine Coffin and Andrew K. Hay, in the years 1836, 1837, and 1838, made some of the best-designed flasks in the American catalogue. We do not know if either of these men was personally responsible for the patterns, but Hay was probably the artist. There is an untrammeled sweep of line, a balance of composition, in all of his authenticated designs which make them

superior to most of the fanciful impressions found upon our bottles. We find no crowding of motifs; the "Weeping Willow Tree" flask is actually mournful; while the "Eagle," "Old Glory," the "Bunch of Grapes," and the "Sheaf of Rye" are equally realistic. These flasks have been found in half-pint, pint, and quart sizes. The pint size is the most plentiful. The color is usually a light aquamarine, but occasionally bluish aquamarine, medium blue, yellowish amber, and (very rarely) amethyst. To date, at least thirteen varieties have been authenticated, as follows:

1 Obverse: Eagle perched on shield above olive-branch; eagle's head facing left, rays about head. Reverse: Flag furled about staff, "For Our Country" in semicircle below flag. Heavy central rib, five ribs each side. Straight neck. Scarred base.

2 Obverse: Eagle perched above plain oval panel, olive-branch and sheaf of arrows in claws, eagle's head facing right, rays above head. Reverse: Flag furled about staff, "Coffin and Hay" in semicircle above flag, "For Our Country" in semicircle below flag. (Form 1.)

3 Obverse: Eagle perched above plain oval, olive-branch and sheaf of arrows in claws, eagle's head facing right, rays above head. Reverse: No decoration, "Hammonton, N. J." in semicircle above, "Coffin and Hay" in semicircle below. (Form 1.)

4 Obverse: Large eagle, shield on breast, olive-branch and sheaf of arrows in claws, eagle's head facing left, above which are thirteen stars. Reverse: Large bunch of grapes. (Form 1.)

5 Obverse: Eagle with large shield on breast, arrows and olive-branch in claws, eagle's head facing left, rays above head. Reverse: Flag, above which are thirteen stars, "For Our Country" in semicircle below. (Form 1.)

6 Obverse: Eagle perched on shield above olive-branches, eagle's head facing right, rays above head. Reverse: Twenty

stars over flag, "For Our Country" in semicircle below. (Form 1.)

7 Same as No. 6, except eagle's head faces left, and eighteen stars surround flag.

8 Obverse: Large eagle, shield on breast, arrows and olive-branch in claws, eagle's head facing left, thirteen stars above head. Reverse: Large bunch of grapes. (Form 1.)

9 Obverse: Spread eagle, shield covering lower part of body, olive branch each side shield, eagle's head facing left, thirteen stars above head. Reverse: Narrower bunch of grapes than on No. 8. (Form 1.)

10 Obverse: Large sheaf of rye. Reverse: Large bunch of grapes. (Form 1.)

11 Same as No. 10, except bunch of grapes is smaller.

12 Obverse: Stag facing right, "GOOD" below animal, "GAME" on right side. Reverse: Large weeping willow. (Form 1.)

13 Same as No. 12, except line below stag, underneath which is "GOOD GAME." (Form 1.)

14 Obverse: Stag, "Coffin & Hay Hammonton" about stag. Reverse: American eagle perched on oval.

Sometime between 1822 and 1824, Jonathan Haines, who had previously built the furnaces at Hammonton and Clementon, selected a site in a forest clearing in Camden County and erected a glass-house upon it. To the village which soon sprang up around the works, Haines gave the name of Waterford, after the famous glass-producing town in Ireland. Haines died in 1828, and the property was taken over by Samuel Shreve, Thomas Evans, and Jacob Roberts. After the death of Roberts, Joseph Porter bought his interest, and the firm adopted the name of Porter, Shreve & Co. Porter soon acquired all of the stock, and took his sons into business with him, the firm being known as Joseph Porter & Sons.

Joseph Porter introduced many innovations into the glass-industry, although like a number of others he has been neglected by many of the chroniclers of our glass. According to Mr. Charles S. Boyer, president of the Camden County Historical Society, Porter closed his plant on the Sabbath. It had been a long-prevailing tradition that a glass-house could not shut down over Sunday while the metal remained in the pots, which were charged during the period from Friday to Monday. Certain alterations made by Porter permitted of the Sunday shut-down; the plan spread rapidly to other plants, until nearly every glass-worker in the country was enjoying a day of rest. This philanthropic man also increased the wages of his employees, enabling them to enjoy a better mode of living. "Waterford wages" soon became a byword in every glass-works in America, and before long the other employers were obliged to adopt the new scale. Heretofore, operatives in the glass-making industry had been, as a general rule, notoriously underpaid, considering the hazards of their work and the fact that few regular blowers or furnace-tenders lived beyond middle age.

Upon the death of Joseph Porter in 1862, his son William C. Porter assumed control of the works; but a year later industrial conditions due to the Civil War forced a shut-down of the plant. It was later reopened, and after 1870 it was organized as three separate factories under a single management, one for the making of bottles and two for the production of window-glass. In 1870 many of the clay molds were disposed of by sheriff's sale, being purchased by R. H. Tice for his son C. B. Tice, who was then running the Isabella house. During the early years of its operation, the

house turned out window-glass, hollow-ware, and bottles intermittently. The Waterford quart flasks are among the rarest of American bottles.

John H. Scott built a glass-works at Estelville, Atlantic County, in 1825. Window-glass and bottle-glass were manufactured, and Scott operated the house alone until 1834, when he sold the property to Daniel Estelle. After a few years John Estelle, a brother, and Josiah Franklin, a brother-in-law, bought an interest in the industry, and by 1844 the factory was employing eighty men. It was later sold to Getzinger & Rosenbaum.

The Columbia Glass Works was erected in 1813 on the Delaware River, about ten miles from the town of Belvidere, in what was then Sussex County but is now Warren County, New Jersey. Francis Myerhoff, a man of practical experience in the glass-business, was the sole owner of the works for twenty years or more, as far as we have been able to learn. The situation of this glass-house was very beautiful, being close to the Delaware Water Gap; and Myerhoff had his sand hauled from the Sand Pond district in the Kittatinny Mountains. It has recently been definitely established by Mr. A. H. Rice of Bethlehem, Pennsylvania, and Dr. Cummings of Belvidere, New Jersey, that tableware was occasionally blown from the "pot-ends" of the window-glass for home use by the workers. Mr. Rice owns a glass plate, Dr. Cummings a number of tumblers, and Mr. Willoughby Farr a footed bowl from the Columbia works. The metal is of good quality, and is light green in color.

Almost nothing has been written about this house.

But we know what it looked like, as Thomas Birch painted a picture of the works from an old engraving by Strickland. On the right-hand side of the painting may be seen the glass-house, which faces the Delaware River at the lower end of the little village clustered about the industry; at the left, one glimpses the Delaware Water Gap, which lies four or five miles northward; in the foreground is a curious river craft called a "Durham boat," with four "pikemen" braced against their poles or pikes as they force their craft upstream. The captain is seated in the stern, rudder in hand. The name of Durham as applied to this craft was derived from the old iron-furnace which stood about ten miles below Easton, where this odd boat was originated for the purpose of transporting the output to Philadelphia.

An advertisement appearing in the Easton, Pennsylvania, "Sentinel" under date of July 21, 1822, reads: "The Columbia Glass Works will continue the blast in the month of August next, when orders will be received for all sizes of window-glass and executed by Abraham Piesch."

In February, 1833, the property was sold to William Heyberger, O. D. W. Lilliendahl, John J. Vankirk, Frederick Salade, and John Beck.

CHAPTER XXVIII

SARATOGA AND OTHER NEW YORK STATE HOUSES

CERTAIN persons have asserted that there were four pre-Revolutionary glass-furnaces in or about Saratoga Springs, but this is probably an error. Few collectors entertain exactly the same opinion regarding Saratoga's early glass-industries, and the existing records are extremely confusing. When one speaks of Saratoga glass, bottles for the famous spring-water naturally come to mind first. Yet a much more interesting manifestation of the glass-blower's art has come to light in this region, both in the early commercial production extremely limited in numbers, and as is evidenced in "offhand" blowing by the bottle-makers.

Mount Pleasant was the seat of one of these earlier works, the house being established in 1801, and a little settlement soon springing up around the then isolated spot. The output was probably hollow-ware of a utilitarian nature. A bottle said to have been made at Saratoga bears the date 1767, which may refer to the year in which one of the first springs was discovered. The large tract of hilly country upon which the springs were found was originally the property of Rip Van Dam, Isaac Low, and a third person whose name is unknown. During the Revolution, Low was accused of treason, his property confiscated, and his holdings in the springs property acquired by one of the Livingston family.

The next Saratoga-district glass-works about which we have definite data was built at Saratoga Village, the workmen being brought from the mountain factory, which was abandoned on account of its inaccessible location. The exact year of its construction is controversial. The Grangers, who operated what was probably the second "Mountain Works," came to this district in 1844. This upper "Mountain Works," "Mount Pleasant," or "Lake Desolation" furnace probably entirely ceased operations after the lower factory got under way. Bowls, pitchers, mugs, vases, goblets, balls, and other articles both in dense amber and light green have been authenticated as coming from the Mountain Works when it was under the operation of the Grangers.

The Congress Spring Co. called its bottle-works the Congressville Factory. This operated until 1890, turning out quantities of deep-green bottles, and varying the shape and lettering as the years went by. In 1856, D. A. Knowlton became interested in the concern, and increased the output until it averaged nearly one hundred thousand bottles annually. In 1865, Mrs. Eliza Sheehan bought the property (one of the very rare instances of a woman's owning a glass-works) and later sold a half-interest to Chauncey Keliner. An incorporated company was formed soon after, with a capital stock of $1,000,000, and was known as the Congress and Empire Spring Co. The Empire Spring was first utilized in 1846, but the majority of the springs were not discovered until after 1859.

Certain collectors of glass are trying to find every known variant of the early Saratoga Springs bottles.

From an advertisement appearing February, 1818,

in the "United States Gazette" of Philadelphia, we learn that the indefatigable "Doctor" Dyott of that city was selling the Saratoga water, as "bottled and wired at the Spring, under directions of Dr. Herman G. Wyncoop."

Dr. Clark purchased Congress Spring in 1823, and in the Lansingburg (New York) "Gazette" of that year we find the following advertisement:

CONGRESS SPRING WATER

The subscriber will have on hand, during the season, a constant suppy of this water, in bottles, which he will sell on moderate terms. As great care will be taken to have it bottled at the Spring with the first quality of corks, and as his cellar is among the best in the place, the public may depend on having it always cool, and in the best of style. An abatement will be made to families taking a quantity.

TAYLOR FORDHAM.

Lansingburg, June 3, 1823.

Glass-company organization was at its height in the State of New York during the first fifteen years of the nineteenth century. The census report for 1810 lists one glass-works in Albany County, two in Rensselaer County, and one in Ontario County, with a total output of 3,805,000 square feet of window-glass annually.

In a private journal kept by DeWitt Clinton at the time when, as a member of the board of commissioners, he was examining the country between the Lakes and the waters of the Hudson in upper New York State, he comments several times upon the glass-industry of the region. At Geneva, August 9, 1810, he wrote: "A glass manufactory is erecting about two miles from the village. It was incorporated last winter,

and a little village is already rising up around it." A few days later he made the following entry:

> We entered the town of Vernon, in which three glass houses are in contemplation; one has been in operation some time. It is rather to be regretted that this business is overdone. Beside the glass introduced from Pittsburgh, and from a glass house in Pennsylvania on the border of Orange County, and the glass imported from Europe, there are ten manufactories in the state already or about to be established; one in Guilderland, Albany County; one in Rensselaer County; three in Vernon, Oneida County one in Utica, Oneida County; one in Rome, Oneida County; one in Petersborough, Madison County; and one in Woodstock, Ulster County.

The Dunbarton Glass Works was erected in 1802, at a village about four miles from Durhamville, New York. It was a cylinder-glass house, its only interest for us lying in an occasional "offhand" extant blown specimen. The factory was still operating in the seventies.

The earlier glass-works in Peterboro was started by Peter S. Smith in 1804; the later one was erected about 1810. Both houses were cylinder-glass industries, but the earlier one is known to have also blown some interesting bulbous bottles. Oneida Lake sand was employed in the glass-making operations. The 1804 house is said to have had one hundred men (Indians) in its employ at one time.

Smith & Solon was the trade-name in 1811, the stockholders being Peter S. Smith, William Solon, Daniel Petree, and O. S. Wilcoxen. In 1818, Backus & Fenn purchased the plant, and ran it until 1830. After the abandonment of the property as a glass-works, the

large frame buildings were used as barns, and one of them is still standing.

The Oneida Glass Factory Company of Vernon was a company organized in Utica to start a glass-works near there in 1809, being incorporated on February 17 of that year. Capitalized at $100,000, the house manufactured window-glass until 1836. In 1822 the company took over the second Utica Glass Works, built by Peter Bours in 1809 or 1810. Although heavily capitalized it never prospered. It is said that the superintendent tried to hire glass-blowers from the Essex Glass Works in Boston, but the operatives, after breaking their indentures, were arrested by the Boston company as they were about to cross the State border; the agent was jailed, and after a prolonged trial, which crippled the finances of the Bours organization, the glass-blowers willingly returned to their former employers. An occasional bowl, pitcher, pan, or smaller glass article has been identified as Utica "offhand" blown glass.

Records of the Rome (Madison County) cylinder-glass works are exceedingly meager. It was managed by Henry and Oscar Granger, German glass-blowers, who failed to meet with success and abandoned their project. They moved to the environs of Saratoga, where they managed the Mountain Glass Works.

William De Zing and James Rees erected a cylinder-glass works at Clyde, in 1828, the works being later operated under fourteen successive ownerships until it closed in 1880. The second factory was erected in 1864 by several stockholders of the first house. It

was a bottle-works, and the two industries were later combined under the firm-name of Southwick, Reed & Company and the trade-name of the Clyde Glass Works.

John S. Foster, one of our migratory glass-superintendents, a metal-mixer of extraordinary proficiency, has materially helped the American glass-collector; for sand, soda, lime, and other ingredients have never been compounded with finer results than by this man. While Foster generally managed window-glass houses, the "offhand" specimens which he and the blowers under him made are among the rarest and most sought-after pieces of glass in America. In color these bowls, pitchers, vases, balls, etc., are a beautiful green with a bluish tinge. In technique they fall unmistakably into the "South Jersey" classification. In fact, until a few years ago all of these examples were attributed without question to Wistar, who probably never made glass so fine of metal or so lovely in color.

One of the works at which Foster officiated was the Redford factory, built on the Saranac River near Plattsburg (Clinton County), construction being started in March, 1831, and finished the following October, at a cost of $50,000. The little town of Redford grew up about the glass-house. Charles Corning and Gershom Cook of Troy, New York, the original owners of the house, purchased a tract of land one mile square, from Philip Kearney in 1830, and there they manufactured window-glass until 1836, when Matthew Lane entered the firm. A year later a Mr. Suydam joined the group, and the industry operated continuously thereafter until 1843. The property was abandoned eight years later.

Saratoga and Other New York State Houses

Three years after he started glass-making at the Redford works, John S. Foster helped to organize and manage a furnace at Alexandria, Jefferson County, which was called the Redwood Glass Works. In April, 1833, Foster went to this locality and contracted for the purchase of ten thousand acres of timber-land from Francis Depau. Building operations were started in June of the same year, and by the end of September everything was in readiness for window-glass making. In the death of John S. Foster, the following year, the industry lost one of the best men it has ever known. The factory drew its fires in 1860. The successive owners of the works were: Schmauss & Co.; Gerlach & Co.; Ingleson, Forbes & Co.; H. S. White; De Zing & Co.; and the Redwood Glass Manufacturing Co. Like the Redford industry, this works has come into recent prominence on account of the few rare and choice pieces of blown glass which were made for the accommodation of the Redwood inhabitants.

CHAPTER XXIX

SALISBURY AND OTHER VERMONT HOUSES

Epapheas Jones, who is thought to have been at one time in the employ of the Pitkins at Manchester, migrated northward in 1803 from the Connecticut Valley near Hartford to the territory in Vermont comprising the townships of Salisbury, New Haven, and Middlebury, where for several years he devoted his time to stock-raising. He then decided to enter the glass-industry, and was granted a charter by the State Legislature in 1811. The works was completed the following year at Salisbury, on the western shore of Lake Dunmore. Henry R. Schoolcraft was a stockholder in the company.

The house began operations in 1813, as the Vermont Glass Factory, window-glass being the chief output. About forty men and boys were employed, and for two or three years the business was so successful that, according to local reports, "money was made more plenty among us, a good market was furnished for a part of our agricultural products, and all kinds of business rendered more active."

As the company made its deposits at the Farmers' Bank of Troy, New York, it issued orders or promissory notes in denominations of $1.00, $1.25, $1.50, $1.75, $2.00, and $3.00, which were printed on bank-note paper and were accepted as currency on a par with bank-notes for several years.

Owing to sudden changes in the prices of glass, and

other unforeseen conditions following the war with Great Britain, the company was compelled to wind up its business in 1816. As the Farmers' Bank at Troy had by this time refused to redeem any more of the glass-factory's currency orders, the company's creditors and the holders of the orders undertook to secure themselves by attachments, which finally dissipated the entire property.

Concerning this factory and its successor of some fifteen years later, Mr. John Spargo writes:

"Ep" Jones left Salisbury in 1818 and settled in Providence, Rhode Island, where he died without issue. This first glass factory, which was known as the Vermont Glass Factory, was erected for the production of window-glass. Bottles, pitchers, and other domestic utensils were made by individual workmen for their own purposes. Only a very infinitesimal part of the early Salisbury glass which appears on the market was made at this first factory during the period indicated, 1813 to 1818. In the eighteen-thirties the factory was restored, business being carried on for some time by the more recent Dunmore Glass Company. The Dunmore was also a window-glass factory, but the workmen made numerous articles on their own account, as was invariably the case in glass factories of the period. I am quite satisfied that two or three pieces which George McKearin and I located there when we first ran onto this factory, before any other persons began to collect Salisbury glass at all, belonged to this first period. We had pretty definite and authentic evidence which antedated the second period. It will thus be seen that the great majority of Salisbury specimens in collections belong to the 1832-1839 period, not to the 1813-1818 period. The latter period, would, however, make them nearly a century old by now.

Nothing remains of the ruins of this early house, and the fields are overgrown; but occasionally one can

find glass slag in Lake Dunmore. The Salisbury slag is sometimes a brilliant blue, while that dug up from the East Middlebury grounds (mentioned farther on in this chapter) is either green or brown, like the slag from Sand Lake in New York State. Some of the Salisbury glass was a brilliant aquamarine. A "hurricane-globe" of this production is as thin and clear as a crystal. Bottles of swirled "Stiegel type" blown in Manheim, Lancaster, Pittsburgh, Wheeling, Ravenna, and other houses, were also blown here, but mainly in the second period. These have a deep pontil mark, and the workmanship is as good as in those emanating from the Manheim furnace—if Stiegel ever did blow them.

Mr. Spargo has encountered many pieces of glass attributed to Salisbury which were actually made in Burlington, Vermont, only a short distance from Lake Dunmore. The confusion is comprehensible, but should be noted by the collector. On page 161 of Zadock Thompson's "Geography and Genealogy of Vermont" (Burlington, 1840), there is a summary of the manufactories and trades of Chittendon County; under the head of "Old Manufactures" the author remarks: "The most important manufactories are that for the manufacture of window-glass in Burlington, and cotton and woolen factories at Winooski Falls." At the second Salisbury plant, pitchers, sugar-bowls, and the general run of household utensils for individual use were also "offhand" blown.

During the 1832-39 operations, the Salisbury factory went under the trade-names of the Salisbury Glass Co. and the Dunmore Glass Co. It has been stated that the works closed in 1842, but a notation in a Burlington (Vermont) newspaper gives the date as late 1838 or early 1839. E. O. Barber of Middlebury

bought the property in 1852, and converted it into a summer hotel.

Simultaneously with the erection of the Salisbury glass-house, George Chipman of Middlebury and several associates undertook the erection of another cylinder-glass works at East Middlebury. The factory enjoyed as thriving a business as did the Lake Dunmore plant, and the two industries gave a great impetus to the towns in this section of Vermont. The East Middlebury Glass Co. also deposited its shinplasters at the Farmers' Bank of Troy, the orders being redeemable at full current monetary value.

The Middlebury glass-house, a large circular building, stood just west of the old Farr Hotel. The company was in splendid financial condition at the beginning of operations; the tax-list of 1816 names the president and directors of the factory as owners of two thousand acres of land. But the general economic conditions following our treaty of peace with Great Britain, which removed the embargo on foreign glass, proved its undoing—as in the case of the first Salisbury venture.

The East Middlebury works deviated from the exclusive manufacture of window-glass in so far as to have one or two pots for the production of brownish bottles. The company's plans, before the crash came, were to erect an additional furnace for the making of flint-glass. Fragments of both green and amber glass are frequently found on the site of the ruins. An extract of interest relating to this work reads: "The amber carboy, which was found in a farm house, is in the Sheldon Museum, Middlebury, and an attached card states—'This bottle was blown at the Bottle

Factory at East Middlebury (a branch of the Vermont glass-factory located at Lake Dunmore) about 1814 and is the only one now known.' " Undoubtedly, other containers from this factory are also extant.

In 1827 a group of progressive citizens of Burlington, Vermont, including Dr. John Peck (a promoter of many enterprises) and Professor James Dean, decided that an up-to-date glass-works would be a splendid asset to their town. Accordingly they organized a company under the name of the Champlain Glass Works, purchased two acres of ground near or on the northeastern corner of Battery Street and Smith's Lane, and erected a group of nearly a dozen buildings for the making of window-glass, with a side production of bottles.

Dr. Peck became the company's first president; Professor Dean acted as treasurer. Nearly one hundred hands were employed, including lumbermen, teamsters, apprentices, and helpers. John S. Foster of Boston, who was connected with a number of our early nineteenth-century glass-works, including the Redford and Redwood plants, was engaged by the stockholders to superintend production.

Frederick Smith leased the Champlain works in 1834 for a three-year period. At the expiration of his lease, he formed a company which purchased the grounds and buildings. The plant was successfully run until 1850, when lack of timber for fuel caused it to cease operations. From 1834 to its abandonment in 1850, the factory was controlled successively by the following firms: Loomis, Smith & Company; Janes, Smith & Co.; Wilkins & Landon; and Smith & Wilkins.

The Champlain Glass Works was primarily a cylinder-glass house. From 1840 to 1850 it did a large Western business, in addition to supplying window-glass of excellent quality to the adjacent territory. The metal was well mixed—a characteristic of the production of every glass-house with which John Foster was associated. He was evidently a master judge of silica and an expert mixer of metals. This brilliant glass, heavier than most of the window-glass of its day, was used for coach windows and lights, clock-doors, leaded fan-lights, and similar purposes. Bottles of all sizes, from one ounce to fourteen gallons, were produced in fairly good number; they conformed to the general shapes of the day, but were distinguished by a bluish-green cast.

The "offhand" blown examples of the Burlington works are as prized as the beautiful pieces which have been handed down in workmen's families of the Redwood and Redford works, and which to-day form some of the choicest examples of our native glass-craftsmanship in existence.

CHAPTER XXX

KEENE, NEW HAMPSHIRE

On June 14, 1814, the new Hampshire Legislature granted articles of incorporation to the New Hampshire Glass Company for a glass-house to be erected at Keene. The shareholders in this enterprise were John Elliott, D. Bradford, Daniel Watson, John Hatch (an innkeeper), Nathaniel Sprague ("a Dartmouth graduate of many attainments"), Aaron Appleton, and Timothy Twitchell. The five men first named were all progressive citizens of Keene; Appleton and Twitchell were residents of Dublin, a near-by village. Acting with good judgment, the incorporators engaged Captain Lawrence Schoolcraft, a veteran of the wars of 1776 and 1812, to manage the industry. Henry Schoolcraft, a son, also was employed.

The "New Hampshire Sentinel" of March 11, 1814, contained an advertisement for bids for the construction of the company's buildings, the specifications calling for "20 foot posts and 40 foot rafters, the work to stand about a half-mile from the Meeting-House." The plans could be seen by applying to T. Twitchell at Mellen's Tavern.

As later erected, the buildings faced Prison Street. The main structure was ninety feet long by sixty wide. Other necessary buildings, including stables for the oxen and horses, were on the property. High piles of hemlock were stacked in regular formation about the place, to give the appearance of little streets, the wood

being thus prepared for fuel by seasoning. There was nothing haphazard about the undertaking.

Cylinder-glass in small sizes was blown for a time. But industrial and financial conditions in general were such that the concern found it impossible to sell sufficient window-glass, or to make collections when the glass could be marketed. The stockholders grew discouraged, the others selling their shares to Aaron Appleton and John Elliott. The latter built a potash-plant to use in conjunction with the works, and eventually put the business on a paying basis. Henry Schoolcraft left the house in 1815, to help establish another glass-industry.

The "Sentinel" contained a notice in January, 1816, which at first brought consternation to Appleton and Elliot. The Boston Crown Glass factory needed blowers, and offered flattering inducements to the Keene employees; but few of the latter departed for the larger joys—or sorrows—of the metropolis.

Prosperity descended upon this model manufactory. Its report for 1820 contains the entry: "Expended, for raw materials $11,400; for wages, $10,000; for contingent expenses $500." It consumed 1825 bushels of sand, 200 barrels of lime, 547 bushels of salt, 36 tons of potash, and from this produced $30,000 worth of glass. Twenty men and five youths were employed.

Everything went smoothly until the panic of 1847, when the owners sold out to the Colony family—Henry, Timothy, and J. D. The latter added green bottle-glass to the regular production (although bottles had previously been blown from the fag-ends of the pots), and "offhand" pieces were blown for home consumption. In 1855 the usual event occurred. Fire broke out, destroying all vestiges of the works.

Collectors and dealers in the vicinity of Keene occasionally find a piece of glass which by family tradition they feel can be attributed to this old "North Works," as it was locally called.

Henry Schoolcraft, Timothy Twitchell, and Daniel Watson lost no time in building another glass-house, on Marlboro Road, after they withdrew from the "North Works." The buildings faced a small stream, Beaver Brook, and Marlboro Road led into Boston, eighty miles away.

The glass-house, octagonal in shape, was forty-two feet at the base and rose to a height of fifty-three feet, forming a cone and terminating in a large ventilator. Wings were erected on either side of the main building to house the raw materials and the pot-making operations. The one large furnace held seven pots; sixteen workmen were employed during capacity production, exclusive of laborers to supply the fuel. Cutting and polishing houses were built on the property, and a ware-room was opened in the heart of the town, on Main Street, near the old Eagle Hotel, where the decanters, tumblers, ink-wells, bottles, and other commodities could be wholesaled and retailed.

Almost immediately, for reasons unknown, Twitchell and Watson withdrew from the firm; and on March 20, 1816, Nathaniel Sprague became a copartner with Schoolcraft. Then, within a few months, these two men sold the property to Appleton and Elliott of the "North Works." But the new owners had scarcely acquired the plant when, becoming alarmed at the precariousness of the glass-import situation, they advertised in the "Sentinel" of November 10, 1817: "Auction at Salem Sumner's Tavern in Keene of Shares

of the New Hampshire Glass Factory upon which assessments remain unpaid. John Elliott, Treasurer."

The factory and grounds were purchased by Justus Perry, who immediately began to specialize in demijohns and black bottles. He built a large stone addition to the already commodious works, and advertised "A complete assortment of glass bottles at the Flint Glass Factory, Keene, and at much lower prices than the Hartford bottles."

Justus Perry, the son of Dr. Justus and Martha Frost Perry, was born in Marlboro, New Hampshire, in 1788. In youth he had learned the saddler's trade, setting up in business for himself at the age of nineteen. Moving to Keene in 1812, he became commander of the Ashuelot Cavalry in the War of 1812, and soon rose to the rank of Major-General of the Militia, although he was but twenty-five years of age. He died in 1842.

John B. Wood entered into partnership with Perry on September 12, 1822. They ran a store in the center of the town under the name of Perry & Wood. Decanters became one of their leading productions. In 1828, Perry's half-brother, Sumner Wheeler, was taken into the firm. On September 1, 1828, Perry and Wood dissolved partnership, and the firm became known as Perry & Wheeler. (Bottles marked "P & W" may be the product of either Perry & Wood or Perry & Wheeler.) On August 18, 1830, Perry and Wheeler announced that they had taken Quincy Wheeler, another member of the family, into the firm. From then on the house was known as Perry, Wheeler & Co.

An advertisement issued by Perry, Wheeler & Co. in February, 1831, makes a feature of "Bottles, contain-

ing from 4 ounces to 10 gallons, which they offer for sale as low as can be obtained at any other establishment in the United States." They also advertised for "Good House Ashes, Hemlock Wood and Produce."

The flint-glass and bottle-glass departments of the business were operated successfully by this family until 1845. Conditions then arose entirely beyond the ability of glass-manufacturers to cope with. The revision of our tariff on imported glass brought disaster to the industry, the duty on the foreign ware being so low that the United States was soon supplied and even overstocked with European glass at a cheaper price than we could produce it on this side. Simultaneously, fuel began to give out. The last blast at the Keene works occurred in 1850.

It is likely that the year 1820 marks the initial production of insufflated-glass making at Keene. Perry made geometrically patterned decanters (with flat-ribbed, mushroom, or rayed stoppers), ink-wells, and hats, in various shades of green and amber. Many of these were formerly attributed to the Stoddard works. He advertised these decanters and inks, but unfortunately used no descriptive or distinguishing designation. He probably made no arched or baroque designs.

On May 13, 1820, "Justus Perry advertised his glass factory in operation; Bottles; fluted flasks, blacking and snuff bottles; inkstands." Of an earlier production, Henry Schoolcraft wrote: "Connected with this factory are works for cutting and polishing all sorts of glass, which enables the proprietors to have their ware finished with a beauty that has been long called for in American glass. . . . Respecting the quality of ware,

I will add, that it has obtained a high reputation for its strength and beauty."

It is generally conceded that the Pitkin house was the originator of both the "Pitkin type" swirl-flasks and the "Sunburst" design. Keene used the double-dipped body in making the Pitkin swirl. The swirl in the Pitkin runs toward the *left*, while that of the Keene twists to the *right*. The technique is very similar.

Keene produced a "Sunburst" as fine as that of any other manufacturer, if not finer, the bottle having an upward and outward sloping form reaching to very high shoulders, the line from the shoulder to the neck being concave, convex, or straight; the neck and mouth are fairly large and straight; the sides of the flasks are deeply corrugated. The central decoration on the obverse and reverse of the bottle varies, certain sunbursts containing a large oval in the center, others a medium oval, still others none. A medium-oval type bears the word "Keen" on its obverse, and the initials "P & W" on the reverse. These flasks are found in half-pint to quart sizes, the pint size being the most common. The colors are sea-green, grass-green, olive-green, sage-green, olive-amber, and golden-amber.

The Keene Masonic flask is one of our most interesting bottles. Johnson O'Connor and Stephen Van Rensselaer place the period of its manufacture between 1816 and 1825, the years in which the activities of the Royal Arch Masons flourished in this section; after 1827 the local chapter surrendered its charter for nearly thirty years. There are at least nine variants of the Keene "Masonic," the divergence lying in the number of blocks in the tessellated pavement underneath the arch, the emblematic figures grouped about

the arch, or in the formation of the letters in the word "Keene." The earlier mold produced a block letter seven sixteenths of an inch high, the central line of the three "E's" being missing; in the later mold the letters are five sixteenths of an inch high, the three "E's" being properly formed. Other identified Keene flasks are the "Cornucopia, Basket of Fruit," the Cornucopia, Spread Eagle, and a "Success to the Railroad." Each in several variations. Justus Perry has unquestionably given us some of our most desirable American glass, including four distinct types—the blown and hand-manipulated; the pattern-mold; the insufflated, and the regular molded ware. The fame of this New Hampshire glass-works will increase with the passing years.

CHAPTER XXXI

THE MONONGAHELA RIVER HOUSES

George Hogg, born at Cramlington, Northumberland, was twenty years old when he left the iron-foundry in which he was working and came to America, arriving at Brownsville, Pennsylvania, in 1804. This settlement, the site of prehistoric earthworks, was known in pioneer days as Redstone Old Fort, and stood at the intersection of the National Road and the Monongahela River. It became an important halting-place during the exodus to the West.

Writing from England to his uncle, William Hogg, who had come to this country and settled at Brownsville a few years before, George Hogg inquired, "Do you have a church in your town?" "No," replied William, "but we will build one." And they did. As the travel increased, distilleries and breweries were soon legion in the Monongahela and Ohio rivers district; and seeing the opportunity for a profitable trade, George Hogg in 1828 built a glass-furnace for green and black bottle-making. A century ago there was nothing incompatible in the erection of churches, distilleries, and whisky-flask factories by one man or one group of men. This frequently occurred in connection with the early glass-industry.

After successfully launching the bottle-works, Hogg leased it to John Taylor & Co. in 1829, retaining supervision of the furnace operations. In a few years John Taylor and Edward Campbell bought an interest in

the factory, the house becoming laconically known as the "J. T."

George Hogg, who had married Mary Breading of Fayette County in 1811, became the father of eight children, one of whom, James Breading Hogg, lost his life on the *Arctic* when she sank off Cape Race in 1854. William and George Hogg had gradually built up a mercantile and forwarding business in the middle West, until they owned fifteen agencies in western Pennsylvania and eastern Ohio towns. They also operated a fleet of "merchant marine" on Lake Erie, with yards at Sandusky and a line of canal-boats along the Cuyahoga River. Glass from the works at Brownsville was in this manner widely distributed.

In 1843, George Hogg left Brownsville, and before his career ended he and his uncle had established no fewer than seventy-six business houses in the above-mentioned States and in New York city, wholesaling grain, groceries, dry-goods, and glassware. This was probably America's first important manifestation of the chain-store plan. It is claimed that at the Hoggs' New York branches, Pittsburgh "ruby" glass was wholesaled to local merchants who passed it over their counters as "true Bohemian."

George Hogg, a splendid type of man, was one of the incorporators of the Western Pennsylvania Hospital at Pittsburgh, and his portrait hangs in the entrance-hall of this institution.

In 1831, John Taylor sold his share of the glass-business to William R. Campbell, the firm becoming E. Campbell & Co. Before the year was over, Edward Campbell disposed of his interests to Robert Forsyth, and Campbell & Forsyth was the firm-name from 1832

to 1834. These latter owners had a reputation for being intelligent and practical glassmen, who improved the grade of bottle-glass and added perfume and scent bottles to their hip-flask and other bottle production. Amber and sea-green "offhand" bowls and pitchers were turned out at odd moments by them and their workmen, according to local historical documents.

In 1834, Forsyth sold his interests to Edward Campbell, who operated alone until a year or two later, when some of the Gabler family came to Brownsville and with a man named Gue bought the plant. This new ownership made bottle-glass for several years, but for some reason (possibly owing to conditions brought about by the 1837 financial stringency) they eventually failed. When put up at sheriff's sale, the business was bid in by its founder, George Hogg.

During the next twenty-five years the works passed through a series of ownerships or leasings, being conducted at different times by Burke, Sedgwick & Co.; Carter & Hogg; Benedict Kimber; Haught, Swearer & Co.; Robert Rogers, and George Wells. In 1864 Wells added an eight-pot furnace, improved general conditions, and for nine years ran the plant with "partial success." In 1873 the industry was purchased by Schmertz & Quinby.

We know that Brownsville made a "Pike's Peak" bottle, an "Eagle, reverse Eagle," the "Union and Clasped Hands," and other standardized types of flasks during the period from 1850 to 1870. It will probably be several years before we can properly place

their varieties of well-known designs; but eventually we shall know just what the old "J.T." made, from the first operations until its fires were drawn.

Several glass-industries were operating along the shores of the Monongahela and Youghiogheny rivers in western Pennsylvania as early as from 1820 to 1826, each of which presents interesting and important possibilities in the field of future research. While window-glass was produced in nearly all of these houses, they also blew hollow-ware, turning out many utilitarian articles, bottles, and flasks. More complete investigation will doubtless reveal types of glass bearing an equal interest with those of our better-known works.

Benedict Kimber, said to have been one of the New Bremen (Maryland) glass-experts who had come to America from Germany with Amelung, migrated westward and built the Bridgeport Glass Works on the Monongahela some time between 1810 and 1820. Kimber was later associated with certain Pittsburgh glass interests, leaving for Brownsville, Pennsylvania around the forties, when he purchased the Hogg glass-works. He died soon after, from cholera.

At the little Bridgeport settlement Kimber is said to have made window-glass, bottles of all sizes, and a small amount of hollow-ware, the output being valued at $16,000 in 1826.

In May, 1927, Mr. James Rose of Canton, Ohio, found what is believed to be the first historical flask bearing the initials "B.K.," which we attribute to Benedict Kimber because it bears all the earmarks of flasks of similar texture and design which have been attributed to the mid-Western district between the

years 1825 and 1840. It is pint size, aquamarine in color, and bears a bust of the youthful-looking "G. Washington" on its obverse, the reverse being the type of eagle found on these earliest "Washingtons." While it may have been made at Brownsville, it is more probably a Bridgeport output. It is said there were three other glass-works at Bridgeport.

Perryopolis, Fayette County, a settlement on the Youghiogheny River, became the seat of the New Boston Glass Works, a window-glass and bottle works, in the first quarter of the nineteenth century. We do not know who built it or how long it ran, but there is a likelihood that its owner or owners had emigrated from one of the glass-houses near Boston to undertake production in the middle West. This factory on the "Yock," as the stream was called, produced eight thousand dollars' worth of glass in 1826.

The New Albany window-glass, bottle, and hollow-ware manufactory was started in this territory around the close of the War of 1812. It was situated four miles below Redstone Old Fort, at the mouth of Red Stone Creek where it empties into the Monongahela. The production in 1826 has a listed value of $16,000. Did former Albany glass-blowers start this industry?

Sometime after 1800, a glass-house was built at Belle Vernon, Virginia (now a part of Pennsylvania), when this was a small settlement. In 1834 the works, owned by Kendall & Patton, had closed down, but in 1836 it was taken over by one of the Eberhart family from the Greensboro plant, who ran it until 1853, when financial losses obliged him to stop the blast.

The blowers at Belle Vernon during the Eberhart ownership were nearly all of the second generation of the Maryland group.

In the early days of its operation we are told that "each blower flattened his own glass in what were called shovel-down ovens. There were no snappers, no second-handers (assistants to the chair-man or the boss-blowers). The phial-holes (usually large enough to serve three workmen, two blowers, and a gatherer) were very small. The tending boys were apprentices bent upon learning the methods of glass-blowing."

In later years the building was purchased by George A. Berry, Samuel Vanhook, and J. B. McKeen.

PART IV

The Third Period, 1827 to 1864

CHAPTER XXXII

THE EXPANSIVE ERA

Until about 1825 nearly every group of men that had attempted to manufacture glass in the United States had sooner or later given up the struggle, selling or leasing their plants to more optimistic but less experienced men, who in turn only occasionally managed to operate their works on a paying basis. Certain glass-industries such as those at Keene in New Hampshire, the Cambridge (Massachusetts) house, Bakewell's at Pittsburgh, and the Federal Hill Works had somehow contrived to worry through; but they constantly required additional capital, and more than once such plants as the Bakewells' had to expend almost superhuman efforts to keep their furnaces at work.

During the first quarter of the nineteenth century, an inflated currency had taken its toll in shattered financial confidence in many of the Eastern States. Wildcat schemes relating to the purchase of public lands in Alabama, Mississippi, and other territory had bankrupted many an affluent gentleman. Long credits had made for economic instability, and increased the cost of freight transportation by pack-mule or on rivers. But by 1825 conditions had begun to improve. Our economic system had somehow managed to withstand the assaults from within and without. A proposal to abolish the credit on duties, which operated as a premium on importations, had been passed by the national House of Representatives, but was sidetracked

in the Senate. Domestic manufacture was being encouraged by the Government. The opening of the great canal-systems was looked forward to with high hopes by all classes of people. Our infant iron-works were gradually pushing ahead. Ambitious pioneers in western parts of New York State, in Pennsylvania, Virginia, and eastern Ohio, were building themselves substantial and well-proportioned homes, after the architectural traditions of their parents' or grandparents' dwellings—homes demanding, among other things, good lamps, good decanters, good tableware. Decadence of style had not yet set in.

When John Quincy Adams presided over the destinies of the nation, twenty-four States had been admitted to the Union; trade, expanding westward and southwestward, increased rapidly. In 1825 citizens were taking pleasure excursions on marvelous steamboats. New York State prepared for its "stupendous" celebration of the opening of the Erie Canal; New England missionaries were for the first time setting sail for foreign parts; New York city assumed the leadership in trade, with the passing of Stephen Girard at Philadelphia; whaling vessels along the New England coast were ceaselessly at work in an endeavor to supply the demand for whalebone and whale-oil; and Thomas Stebbins of Connecticut, astute Yankee and practical patriot, conceived the remarkable idea of stamping the busts of our state and national heroes upon the American-made bottle.

Nemackolins Path, better known as Braddock's Trail, starting at the mouth of Wills Creek, where Cumberland now stands, crossed the mountains to the Monongahela River, at the mouth of the Redstone—the site of the Old Fort, where Brownsville now stands.

A branch of the trail continued on to the forks of the Ohio. After General Braddock's disastrous expedition, this became the great artery used by explorers and traders into the West; and the final completion of the Cumberland Road to Wheeling, Virginia, was the greatest single factor in the colonization of America west of the Alleghanies.

It was not long until thousands of men and women, from New Hampshire to Georgia, were turning their faces westward and following the paths of emigration. This great exodus brought about a new social order, a new economic and industrial scheme of things. Centers of trade shifted as the sands of the sea; towns such as Lockport sprang up as by magic. The Tuscarawas River banks and the Portage Path in Ohio were dotted with new seats of the potter's trade and the glass-industry. Pewterers, weavers, tallow-chandlers, chair-makers, gunsmiths, clock-makers, braiders of Milan straw hats for women, iron-forgers, cobblers, tanners, and harness-makers were soon plying their trades in little Western towns such as Cleveland, Indianapolis, and Chicago.

Political parties disputed and harangued; the colored lithograph, the cup-plate, and the whisky-bottle were soon blazoning "the people's candidates" for all the land to see. Religious groups were dissenting, breaking away from the parent group, and establishing themselves elsewhere in little communities, replicas of their more easterly homes; taking with them their few precious pieces of glass, their slip-ware pottery, their painted chests, and their baptismal records; using the same pewter communion-cup, the same lights on their pine-trees on Christmas Eve, as their grandparents had bought from Stiegel's store.

Roving and migrating, orating, disagreeing, forever building, our people were inevitably acquiring a certain homogeneity and a national consciousness. Nowadays one is likely to underestimate the great part which our canal systems played in the building up of our republic. Next came the railway, and the real formative period of America was at an end. Where is the glass-collector who has not been moved to retrospective thoughts as he has held a "Success to the Railroad" flask in his hands? These olive, amber, or sage-green containers seem very far removed from us, these days, yet scarcely a century has passed since the first primitive narrow-gage railway became a reality.

It was not many years until we began to cast overboard many of our ingrained Old World traditions. We discarded the fine forms of English furniture and furnishings; we were becoming impatient even with the line and design given birth after Napoleon's contemplation of the Sphinx. We did not want cut Waterford decanters, or an endless succession of blue plates from the Staffordshire district of England. So the Keene, Cambridge, Sandwich, and Coventry glass-house owners gave us blown articles, greatly resembling the design of the heavy lead-flint foreign glass, but much lighter in weight. Not that we advanced architecturally, or in many of the useful and decorative arts—we slid down the scale of the truly beautiful as swiftly as a foot-loose people generally slip before they come to a halt and find themselves again. And as we took up the stupendous epic march of empire toward the Pacific coast, we acquired a taste for the expansive and voluminous necessities and accessories of living.

The picturesque Andrew Jackson presided at the White House from 1829 to 1837. The era was a

colorful one. In 1830 silver was the universal coinage, the general circulating medium; gold was the basis of foreign exchange. By 1837, Jackson's financial policy had brought about another money stringency. Transportation rates became prohibitive. In the Pittsburgh-West Virginia-Ohio district, when the rivers were frozen up or too low for navigation, wagons carried the merchandise to points of distribution, a five-ton weight being allowed to a span of six horses. Freight rates for glass were from $3.50 to $10.00 a hundredweight from Philadelphia to Pittsburgh, and $1.00 a hundredweight from Pittsburgh to Steubenville, Ohio; the charges being regulated by "route, weather, and nature of the goods hauled." A good span of horses for such work cost $200; oats were 18 cents to 26 cents a bushel; corn, 25 cents a bushel; hay, $6.00 a ton.

It was a period of ostentation and display among the well-to-do. Dueling was still prevalent. A traveler sojourning in Pittsburgh wrote home that "everyone, high and low, great and small, rich and poor, male and female, clergy and laity, makes free use of whisky; it is as common a supply upon the sideboard as bread and meat." William Henry Harrison's campaign, commemorated on some of our glass cup-plates, stressed the hard-cider barrel and the little log cabin. Vast quantities of food and drink were consumed; and the voice of the American evangelist was raised in the mountain districts of Kentucky and Tennessee. Little villages, comprised of eight or nine houses, a church, and a general store, were proudly named Rome, Ithaca, Athens, Florence, Cairo, Berlin, London, Paris, Troy, or Venice. Every trans-Alleghany town boasted its Washington, Jefferson, Franklin, and Adams streets.

We took on airs. We wanted to be all-American little Romes and Londons. We already boasted of a log-cabin nativity. And our pressed glass soon embodied a heaviness of both form and pattern. By the eighteen-sixties our compotes had become as ponderous as our draperies.

After the panic of 1837, the glass-houses which had weathered the storm steadily advanced. In 1860 their production amounted to $700,000 in value. Then came the Civil War. Nearly every glass-house was obliged to cut its working force to the lowest possible number; many plants completely drew their fires. The glass-house crews shouldered muskets, the mold-chippers laid down their chisels for the bayonet; the "rosin-monkeys" and cullet boys proudly strode forth with beating drums. And the women, left alone, had neither heart nor money for the scintillating prism or the opalescent tie-back—no money even for the inexpensive cup-plate and honey-dish. After the close of hostilities, glass-making in America assumed an entirely different aspect. Lead-flint glass operations were virtually abandoned. The era of bad taste, which had its beginnings thirty years before, was now so firmly established that even our lamp-bowls, bread-plates, and fruit-bowls showed a decadence in form or design.

In 1870 no less than one hundred and fifty-four glass-houses were operating more or less successfully in the United States. These houses represented an investment of nearly fourteen millions of dollars, and their production for the year was valued at nearly sixteen and a half millions. They employed more than fifteen thousand workers. Good glass was still blown and pressed, but hundreds of tons of ware absolutely beyond the pale were eagerly seized by an avid public.

Our domestic manufacturers would have amassed fortunes had not the foreign hold on the American glass-market still been so tenacious. Europe's ability to produce glass at a much smaller cost than ours gave our manufacturers a constant struggle until 1883.

Summing up the entire situation, it may be said that from our earliest primitive experiments in 1609 until 1883, the makers of American glass had a hard time of it. Unlooked-for occurrences, over which they had no control, happened time and time again, until the real wonder is that we had any glass at all. No industry could possibly have suffered more setbacks and handicaps. The appreciation of the remnants which have survived these various vicissitudes should be fostered and encouraged by our generation, that Americans of the future may in part comprehend the significance of our early glass.

CHAPTER XXXIII

OUR EMERGENCE INTO THE MECHANICAL

The pressing-machine was invented in 1827 by Enoch Robinson.

Blown glassware takes its form from a mold under the pressure of a workman's breath or of mechanically compressed air; whereas pressed glassware takes its form from a mold under the pressure of a mechanical plunger. Blown glass generally takes the design or pattern of the mold on both exterior and interior surfaces, if the glass is not too thick; pressed glass takes the mold pattern or design on its exterior surface only.

The mold used in the glass-press is usually made in two or three parts or sections. Occasionally, however, a one-part mold is employed; and again, a mold of four or even more parts. Most of the pressing-machine molds are made of cast-iron, although steel molds are sometimes used.

In glass-pressing operations, the molten metal is first poured from a long-handled ladle into the opening of the mold, the workman being able by practice to gage the exact amount necessary to produce the piece required. This liquid metal is then quickly forced into all parts of the mold by the plunger, which is usually operated, with a long handle or lever, by another worker.

The pressing-machine produced a pleasing and suitable glassware for the plainer people who had not been able to load their boards with cut glass from Europe,

PLATE 33 *Metropolitan Museum of Art; Mr. Israel Sack*

Insufflated plates and saucers—attributed to Massachusetts flint-glass houses

PLATE 34 *Mr. Earl J. Knittle*

Types of glass made at mid-Western houses

PLATE 35

Mrs. Mary Sampson and Mrs. F. M. Nichols

Cobalt insufflated vases and decanter—attributed to Massachusetts flint-glass houses

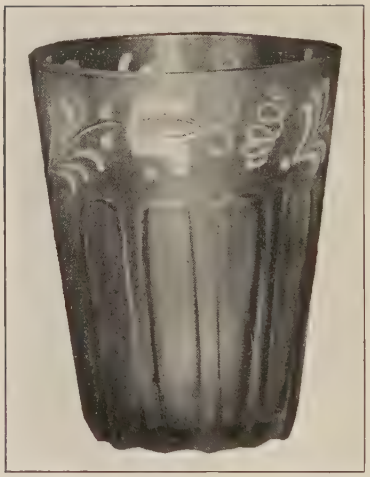
PLATE 36 *Metropolitan Museum of Art*

Whorled or striated bicolor and tricolor effects

PLATE 37

Mrs. F. M. Nichols

Pressed glass from the New England Glass Co.



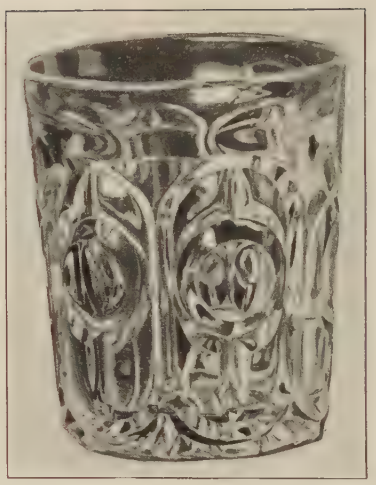


PLATE 38

Messrs. McKearin and Keyes

Various types of blown and pressed tumblers

PLATE 39 *Mr. McKearin and Mrs. Sampson*

Mountain Works (Saratoga) wash-bowl and pitcher
Emerald-green examples embodying same South Jersey technique

PLATE 40

The marked "Keen" Sunburst "George Washington" expanded neck

"Antiques," The Toledo Museum of Art

"Eagle" canteen
The Zanesville "Masonic" type

PLATE 41

Mr. A. H. Hayward

Group of Massachusetts lamps—blown and pressed

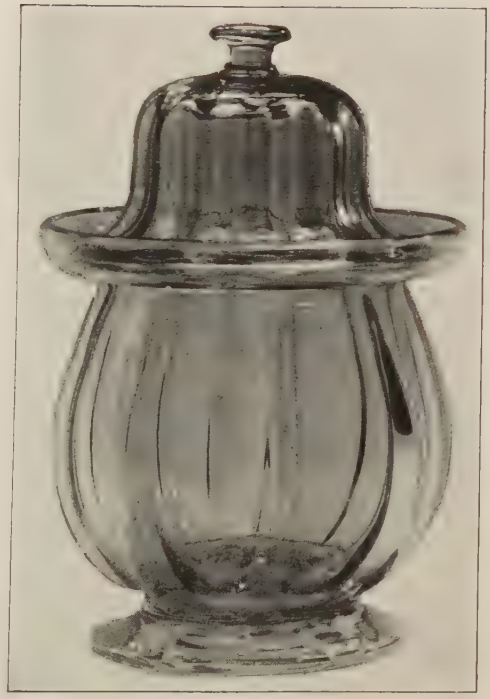
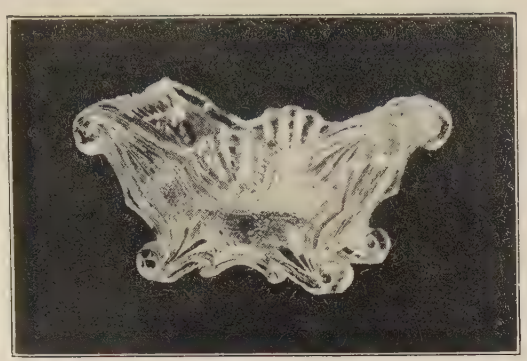


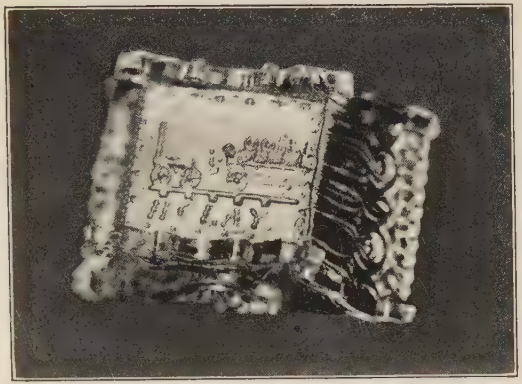
PLATE 42 *Mr. E. J. Knittle*

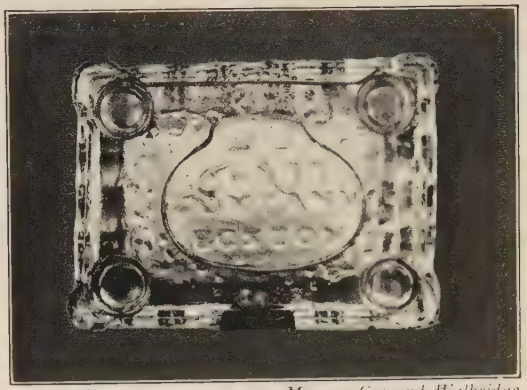
Mid-Western clear-flint sugar-bowl

Dr. J. H. West

Swirled and fluted expanded bowl attributed to the middle West







Messrs. Coe and Walbridge

PLATE 43

Marked "H. Clay" Engine and Tender salt

Marked "N. E. Glass Co. Boston" salt

PLATE 44

Mr. David Belasco; Miss Mary Conrade

Christmas-tree light
Green hearth tile by Kearns

Jacony basket
Butter mold by McKee

Early type of ball
Toothpick holder

PLATE 45

The Toledo Museum of Art; Dr. J. H. West

Perfumes made in two-part molds. Sea-horse Millville perfume
American copies of French unguent bottles

PLATE 46 *Mr. George S. McKearin*

Lamps in Mr. Ford's collection attributed to Sandwich

Mrs. Frances M. Nichols

PLATE 47

Pressed tea and toddy plates and compote, New England Glass Co.

PLATE 48

"Antiquarian Magazine"

Various types of flasks

"Lafayette, Eagle" "Washington, Eagle" "Cornucopia, Eagle" The "Albany"

New York, or New England. It became even cheaper than the Staffordshire wares which were supplying our tables. By 1845 nearly every home in the United States was using pressed glass.

Once firmly established, the pressing-machine revolutionized processes, wage scales, exports and imports. It is questionable if the invention was a blessing from the esthetic standpoint, but it brought financial independence to many of our glass-house owners—a condition previously almost unknown. It put glass-making upon its feet.

This machine was thoroughly detested by the old-timers—the efficient glass-blowers who had come, or whose fathers had come, from the great glass-industries of Prague, Bremen, Antwerp, or Cork. These men realized the superiority of the breath-blown and hand-manipulated metal over the machine-made sort; they saw their long apprenticeship, their pride in their profession, coming to naught. The passing of the established order was more than the older blowers could be reconciled to. That a portion of these workmen refused to conform to the new order has enabled us to enrich our collections with many a blown example which otherwise might not have come into existence. By the close of the Civil War the older artisans were dead, as were many of the younger. Lead-flint glass was discarded for soda-lime, and the early phase of American glass-making was at an end. The pressing-machine, the Civil War, and the Leighton process had brought this about.

American methods of making pressed glass were introduced into England in 1834, although that country had previously used a device for the pressing of footed salts prior to our earliest patent. In 1836, James Ste-

vens of Birmingham, England, produced a heavy pressed-glass tumbler from an English device. From the time our pressing-machine was introduced into Europe, glass-making was temporarily disrupted. Certain manufacturers, attempting to maintain the previous high standard of their flintware, went to the wall. The beautiful cut, etched, and engraved glass of northern Bohemia dropped fifty per cent in value after the Continent was invaded by the pressing-machine.

France shortly became England's rival in the field of this machine-made ware. Not only did the French artisans employ more or less orthodox faceted designs; with their innate flair for daintiness and delicacy of pattern they also introduced all manner of relief ornamentation. They borrowed motifs from the Greek, the Roman, the Gothic art, in the forms of the key, the volute, the arch. The anthemion, acroteria, and acanthus were pressed into their glass patterns, which we soon copied. We gave France, the home of the finest European pressed glass, the machine for the work, and she gave us her designers with their ability to execute the most lace-like patterns.

In considering American glass, it is well for us to remember that while we have been rich in invention and improvement, we have turned to Italy, Spain, Bohemia, Germany, France, England, and the Low Countries for our prototypes. Elaborating or simplifying these, we have produced forms and designs more or less composite. Our glass-pots have truly been melting-pots. We have shown remarkable adaptability; we have assembled and assimilated. Our pressed glass has been orthodox and it has been heterodox; it has strayed into many by-paths and mazes of design. It may be very, very good, or it may be horrid.

Our earlier pressed glass was generally colorless. Cobalt blue, canary yellow, and a rare rose are represented among the earlier colored specimens. Frequently attempts have been made to prove that certain colors were used solely by certain houses. This is possible, though not probable. As certain colors became popular, they were adopted almost simultaneously by nearly all the flint-glass houses, whose chemists were constantly experimenting with theories and formulæ in coloration. Some really remarkable shades and combinations of shades were produced. Transparent purples and crimsons, opaque turquoise and apple-green attained a great vogue between 1850 and 1865.

Although the editors of our publications devoted to antique subjects have repeatedly stated that "all is not Sandwich that glitters," it has been uphill work to convince the majority of purchasers, and not a few dealers, that scarcely one twentieth of the pressed glass on the market and in collections was made on Cape Cod. This fact in no way lessens the value of the glass —another fact which many persons seem reluctant to believe. The name Sandwich in relation to American pressed ware has become almost generic. Not only is this misleading, but it works harm both to the Sandwich company and to the other houses. Not a week passes that I do not see the poorest quality of metal and design called Sandwich glass, the error being extremely derogatory to this house with its excellent grade of clear metal and frequently good design. Loose nomenclature has tended to exaggerate the Sandwich output, although the latter was large and fairly steady for more than half a century. We also have been inclined to underestimate the fine early glass *blown* at Sandwich, and at the Pittsburgh and Cam-

bridge plants, and to overestimate the later *pressed* ware from all of these houses. In Pittsburgh alone, fourteen pressed-glass establishments were operating between 1830 and 1872, employing a yearly average of three thousand hands. Their buildings covered twenty-two acres of ground, and the value of the machinery was $1,580,000. Thirty-two thousand tons of pressed tableware were turned out in this city annually during a majority of the years between 1848 and 1872! In 1863 the shipments by rail alone from Pittsburgh, of tableware only, were:

To Pennsylvania	56,235	packages
" New York	79,626	"
" Maryland	22,791	"
" Massachusetts	2,197	"
" California	050	"
" Vermont	078	"
" Ohio	66,045	"
" Illinois	107,223	"
" Kentucky	25,212	"
" Texas	287	"
Total packages sent East	141,646	
" " " West	308,009	

The period of "lace" glass, with its stippled or snakeskin background, ended around 1850, the patterns which followed not depending upon this stippled effect in the background as a foil for the design. The discriminating collector generally prefers the lacy designs to those which came after—with certain exceptions. Barytes earths produced the silvery, frosty look which the better grade of "lace" glass displays. Not all the flint-houses used this earth, Lyon and

Jarves being the first two manufacturers to appreciate its value. Barytes is generally found combined with either sulphuric or carbonic acid. Its sulphate is the most plentiful, being frequently met with in England. Generally it is common in copper-mines. It was formerly called "ponderous spar." Barytes is distinguished from all other earths in that it is precipitated by muriate of potash and gives a yellow tinge to flame. It supplies an excellent and unchangeable white for painting in water-colors.

Some persons claim that, in the case of certain patterns used by all of our glass-houses, they can unerringly identify the particular piece as made by a particular house. Personally, I cannot tell a Sandwich "bell-flower" from a Lyon, or a McKee "acanthus" from a Beatty & Stillman. I have three friends in widely separated parts of the United States, each of whom owns a set of glass consisting of a dolphin-and-shell tazza, or compote, and a pair of dolphin candlesticks to match. Each set is made from beautifully clear metal; the design and size are exactly the same in all three cases. One of these friends is the granddaughter of a superintendent at the Sandwich factory; one is the grandson of a member of the Bakewell firm of Pittsburgh; one is a collector whose mother bought her pieces from the man who made them at the Lyon works. The Bakewell-owner feels indignant when his dolphins are called Sandwich; the Sandwich-owner feels likewise when she sees her dolphins pictured as Bakewell; the Lyon-owner cannot convince her best friends that her dolphins are really Lyon!

Great rivalry existed among many of the manufacturers in getting out saleable patterns. Some of the houses offered new designs to the public at the first

of each year. A large amount of money was spent in securing novelties and in preparing the models, molds, pattern-books, and catalogue sheets for the trade. Few of the early pattern-books seem to have survived.

The profitable life of a design was limited to one or two seasons, unless it proved an exceptional seller—such as the perennial "bell-flower," which attained unprecedented popularity. Schemes were launched by which designs such as the "Halley's Comet" were popularized, by wide-reaching publicity methods. Lawsuits over copyright or patent-infringements were long and costly procedures. Rather than become involved in court litigation, the managers followed a bear-eat-bear course, each one helping himself to the forms and patterns of the others. Prizes were offered employees for creative work, and the degeneracy in both form and design which crept into the glass-industry (as it did into every other field of household manufacturing) from the sixties to the nineties was mainly brought about by the keen desire on the manufacturer's part to foist something new and original on the public.

Certain backgrounds, such as the "snakeskin," or "stipple," the fine "dewdrop," the "waffle," and various geometrical arrangements, were utilized as a basis for many designs. The work of compiling, standardizing, and cataloguing our early glass-patterns in pressed ware alone, will require infinite time and patience, and will have to be approached by an unprejudiced student; but it can be done.

These manufacturers of the forties to sixties were never sure which way the wind of popular fancy would blow. If a certain form or design was taken up by the public, the season would prove extremely profitable, and the popularity of the patterns would possibly

tide the makers over an otherwise lean season to follow. If the opposite occurred and a pattern fell flat, the losses were heavy.

When a pattern had become stabilized, the jobbers sent their specifications for so many dozen gross of the article to the various manufacturers, accepting bids from each, the contract being awarded to the lowest bidder. Close competition was inevitable. A commission merchant might have in his warehouse salts, goblets, or candlesticks of the same pattern but produced by three different houses. Sometimes the retailer knew whose glass he was selling; sometimes he did not.

Mr. Homer Eaton Keyes says:

> The vagaries of design in glass hollow-ware have always been such as to render hazardous any attempt to determine dates of individual pieces on the sole basis of any stylistic peculiarity. What in earlier times was confusion, develops into sheer chaos during the mid-nineteenth century.

It is frequently asked why so few pressed pieces were stamped or marked with the manufacturer's name. While nearly every other manifestation of art and craftsmanship received the mark or signature of its maker, glass has usually been devoid of such identification. It is not known why our manufacturers marked the *salt*, to the almost total exclusion of every other form until the flask-makers stamped a very small part of their production. In the majority of instances, they are the only known pieces which bear the stamped names of the factories in which they were made. Seven salts are marked or variously stamped.

The following is a partial list of patterns used in

general by American manufacturers of pressed glassware, nearly all of these designs being utilized by the industry prior to 1864. It is impossible to catalogue here the infinite variety of patterns used in our earlier "lace" glass, over three hundred varieties of cup-plates alone having been found in this conventionalized group.

Gothic or Arched
Etruscan
Arabesque
Saxon
Grecian
Rochelle
Boston
Cincinnati
New York
Halley's Comet
(bull's eye and feather)
Argus-Eye
Thumb-Print
("printies")
Oval Print
Chain
Waffle
Quilted
Grant
Mitre
Flute
Prism
Panel
Ribbed
Waterford or Hamilton
Diamond
Diamond Point
Hob-Nail

Star and Feather
Sunburst
Loop and Jewel
Bee-hive
Butterfly
Birds
Lions
Dogs
Deer
Lamb
Bleeding Heart
Fuchsia
Rose
Tulip
Morning Glory
Daisy
Bell-flower
Cherry
Pineapple
Grape
Mulberry
Acorn
Thistle
Oak Leaf
Maple Leaf
Fern
Mushroom
Wheat

Designs in which the Cornucopia, Shield, and Acroteria are leading motifs
Anthemion
Heart
Acanthus
Dot
Dew-Drop
Star
Star and Leaf
Eagle motifs
Ships and other transportation facilities
Portraiture
Patriotic or Political patterns
Religious subjects
Log Cabins
"Westward Ho"
Indians
Rebecca-at-the-Well
Comics

CHAPTER XXXIV

THE NEW ENGLAND GLASS CO.

In 1815 several expert workmen of the South Boston glass-works left that concern, formed a company under the name of Emmit, Fisher & Flowers, and leased the idle works at East Cambridge belonging to the Boston Porcelain and Glass Company. All three members of the new firm were skilled craftsmen who had come to America from European industries. After two years of unsuccessful operation, they decided to liquidate, selling the property at public auction in 1817 to Deming Jarves, Amos Binney, Daniel Hastings, and their associates, Jarves controlling the majority of the stock. This new organization was granted the right to manufacture "Flint and Crown Glass of all kinds, in the towns of Boston and Cambridge." The firm started with a capitalization of $40,000, engaged Fisher as superintendent, improved the buildings, hired forty men, and began operations under the trade-name of the New England Glass Co.

Up to this time (1818) few sand deposits had been discovered in this country. Until the discovery of the Wills Mountain deposits in Delaware, the New England company used silica brought from Demerara. It was the first Eastern glass-works to burn West Virginia coal. England had maintained her superiority in flint-glass making by the possession of secret formulæ, and until these could be discovered the native product could not hope to compete with im-

ported glass. America sorely needed a man whose scientific ability could unravel some of the chemical problems which confronted the manufacturers. That man appeared upon the scene in the person of Deming Jarves.

Of exceptional ability, far-sightedness, sound business methods, and inventive skill—a rare combination in a man of decidedly artistic temperament—Jarves became a creator in the chemical, mechanical, and artistic processes of glass-making.

England, with her monopoly of flints, would not export them—a perfectly comprehensible attitude. Red lead or litharge was essential to the making of brilliant yet soft-toned metal suitable for cutting, and American glass-makers did not understand the secret of its compounding. Jarves proceeded to build a set of red-lead furnaces, following a book which treated casually of the arts and sciences; and such was the man's acumen that he obtained results from his first experiments which surpassed his and his partners' most enthusiastic hopes. From this time on, he not only provided for the needs of the New England company, but supplied such great houses as Bakewell's in Pittsburgh, and actually monopolized the American red-lead market for a period of over thirty years, making everything from the highest grade of "galena," or painter's red lead, to pig-lead. The New England company was now able to compete with the English-Irish market.

Writing of the New England Glass Co., in 1818, Bishop says:

> Two flint-glass furnaces and twenty-four glass cutting mills, operated by steam, and a red-lead furnace, capable of making

two tons of red lead per week, enabled them to produce every variety of fine, plain, mold, and the richest cut glass, as Grecian lamps, chandeliers for churches, vases, antique and transparent lamps, etc., for domestic supply and exportation to the West Indies and South America.

The capital stock was increased to $80,000, and the annual production amounted to $65,000. The opalescent glass which the New England company was now turning out was said to be superior to any in the world, and was being produced in larger quantity.

The first advertisement of this company, of which we have knowledge, appeared in the "Boston Commercial Gazette," for May 21, 1818, and reads as follows:

Leachmere Point.

They have now on hand, at the Manufactory, a complete assortment of FLINT GLASS, of superior quality,

—consisting of—

Apothecary & Chymical Wares,
Electrical Apparatus,
Entry Lamps,
Convex Clock Faces,
Vase and Candle Shades,
Globes, all sizes and kinds,
Decanters . . . Tumblers . . . Wines,
DISHES . . . Plates . . . Salts, &c.,
Also est. for CUTTING GLASS

orders left by mail at Henshaw & Jarves—No. 20 Broad Street and N. Hasting's & Co No. 31 Marlboro' Street.

DEMING JARVES, Agent.

After lead-flint furnaces were under way, the company sent to Ireland for cutting experts. Mrs. Francis M. Nichols of Boston, one of the few glass students who have collected facts concerning, and pieces made

by the New England company, tells me that one worker, who had been a leading cutter in the Waterford factory, mixed the glass, blew it, and cut it, exactly as he had done in Ireland, producing specimens so like the Waterford that even the owners of the plant could not always tell the difference. A very fine but, unfortunately, broken piece from this expert's hand is now owned by an old gentleman who was once employed by this firm; ninety-nine out of one hundred persons would attribute the piece to Waterford. This instance only emphasizes the point that careless or sometimes even careful attribution is a dangerous thing. The decanters, wines, and tumblers are so like Irish glass that it is extremely difficult to differentiate between the two.

Mrs. Nichols, in her many comparisons of authenticated examples of this factory's blown glass, finds that the early metal is usually full of small bubbles, and that its color is never a perfectly clear white, but always has a very slight greenish or pinkish tinge. This is an important fact to remember.

By 1823 an enormous production was being marketed,—22,400 pounds of glass vessels per week,—much of which was beautifully cut in the Waterford manner, being sent to Boston, and thence all over the western hemisphere. Jarves left the firm in 1825, to found the Boston and Sandwich Glass Company.

It was the fortune of the New England company to give the glass-industry a process so revolutionary as radically to alter the future course of glass-making. However, by so doing, this firm struck the first blow at its own highly developed apprentice system, and at the esthetic side of glass-making. This refers to the invention of the pressing-machine.

In 1827, Enoch Robinson, a carpenter employed by the company, decided that he wanted a certain shape in glass which it was impossible to blow. He conceived the idea of a mold in which, under mechanical pressure from a plunger worked by a hand-lever, he could fabricate this special piece. Broaching the idea to a fellow-workman, a practical glassman, he was assured that it was feasible. Robinson contrived a crude machine, dropped some molten glass into it, pressed the hot metal against the sides of the mold by means of a plunger, and the glass industry was changed forever.

The wonder is that the device was not worked out sooner. Deming Jarves, who is sometimes incorrectly accorded the honor of inventing the pressing-machine, was approached by a workman at the new Sandwich plant just after Robinson, unknown to them, had constructed his first primitive model, and almost at once a crude machine for the pressing of a tumbler was contrived. Robinson, however, obtained the first patent rights upon his machine; but Jarves and others, including Robinson, very shortly improved upon it. It would be foolish to hazard a guess as to which of these two houses turned out the most pressed glass between 1832 and 1862. The demand for the ware exceeded expectations. By 1832 the New England company was sending shipments of fine pressed glass to England, and the first notable consignments to foreign ports were produced under the Enoch Robinson patents. These patents had been vigorously contested by other American glass-makers, including those of Sandwich and Pittsburgh; but they were fully sustained in a lawsuit in Philadelphia.

In time the Sandwich and several of the Pittsburgh glass-houses produced a clearer, more brilliant and

silvery-looking metal used in the making of lacy patterns than did the New England company. This was due to the introduction of barytes earth into the mix. The New England company made blown glass of all kinds, insufflated glass in clear white and cobalt blue, dozens of varieties of lamps, candlesticks, cup-plates, salts, and other tableware in pressed glass. They employed all colors, and made much glass now attributed to Sandwich.

From 1843 to 1865 Captain Joseph N. Howe was the active head of the works, and during his régime pressed glass almost supplanted chinaware on American tables. The New England company always maintained prestige by reason of its prominence in the development of pressed-glass making. Strange as it may seem to-day, this factory is acquiring a somewhat belated position of importance in the eyes of the modern collector, not so much for its beautiful cut and pressed glass as for its lovely insufflated types.

Another early head of the company who became, like Jarves, the well-known founder of a later large glass-house, was John L. Hobbs, a man who thoroughly understood both the mechanical and the artistic requirements of good glass-making. He left Massachusetts in 1844, in company with James B. Barnes, and going to Wheeling, where coal had solved the fuel problem, the two established a glass-works which soon rose to national importance.

Thomas Leighton, a Scotchman by birth, also belonged to the group of skilled workmen, trained by the New England company, who rose to prominence in other glass-making activities. The life of Leighton reads like a romance. As a boy of seven he began

work in a glass-works at Birmingham, England. In his late twenties he determined to seek a larger outlet for his talents, in the New World, and managed to make the voyage to America as a stowaway. He secured a position with the New England Glass Co. and was immediately recognized as a worker of exceptional ability. The father of seven sons, he saw the six who lived follow in his footsteps and become exceptionally proficient in the glass business. John became expert in the handling of glass; William, as a metal-worker, excelled in preparing the batches; Thomas junior, developed great skill in blowing odd, irregular, and beautiful shapes, being able to imitate the Venetian types to perfection, and also to execute laboratory retorts and other chemical apparatus. This special ability of the Leightons was carried on into the third generation, Thomas the third being the "gaffer" of the New England Glass Co. in later years. William Leighton, son of the original Thomas, became the inventor of the lime-glass process, while associated with Hobbs and Brockunier in the West.

From 1865 to 1870 the house had its fourth manager in Henry Whitney, Jr., another efficient glassman raised in the business.

As a result of the inroads made by lime-glass in the market, for crown and flint glass, after 1864, the New England company's directors, deciding that they did not wish to adopt the lime-glass process, withdrew from active management of the company's properties. The latter were leased in 1870 to William L. Libbey, who took over the works and became the last manager.

In 1874, Edwin Drummond Libbey entered the office of his father, learning the glass business "from the ground up." In 1880 he was taken into partner-

ship, and the firm became known as "The New England Glass Works, W. L. Libbey & Son, Proprietors." William Libbey died in 1883. Five years later Edward moved the entire personnel of the organization to Toledo, Ohio. In 1890 the New England Glass Co., as such, surrendered its charter, and the business was incorporated in Ohio as "The W. L. Libbey & Son Company, Proprietors of the New England Glass Works." In 1892 this unwieldy name was simplified to "The Libbey Glass Company."

W. L. Libbey received his early training in the Boston house of Jarves & Commerais, importers, jobbers, and manufacturers, the Jarves of this firm being George D., one of the gifted sons of Deming. In 1837, Deming Jarves started a glass-works for George, calling it the Mt. Washington Glass Co. In 1860 this works became the property of Captain Timothy Howe and W. L. Libbey, the latter becoming its sole manager after the death of Howe in 1866. In 1870 the plant was disposed of, and Libbey then became manager of the New England Glass Co.

CHAPTER XXXV

THE BOSTON AND SANDWICH GLASS COMPANY

DEMING JARVES, whose name is inseparably linked with Sandwich glass, was born in 1791, his home being near the corner of Tremont and Boylston streets, Boston. Taking a position with the New England Glass Co. very early in life, he made a name for himself while still a young man by ferreting out the process by which red lead or litharge was combined with the various ingredients which went into the composition of flint-glass, as secretly employed in the English-Irish glass-houses. Endowed with gifts which amounted to little less than genius, Jarves soon reached the conclusion that he could successfully manage and control a glass-industry of his own, although a financially paying business of this sort was then almost unheard of.

The resulting company which he promoted had formulated its plans in Boston in 1824, where the largest amount of capital had been secured, the organization being perfected the following year. The Act of Incorporation may be found in Chapter 99 of the Acts of 1825, Private and Special Statutes of the Commonwealth of Massachusetts, as follows:

SECT. I. *Be It Enacted Etc.* That Deming Jarves, Henry Rice, Andrew T. Hall, Edmund Monroe, and such persons as may become associated with them and their successors and assigns be and hereby are made a corporation

by the name of the Boston and Sandwich Glass Company for the purpose of manufacturing glass in the city of Boston and town of Sandwich, in the County of Barnstable, and for that purpose shall have all the powers and privileges, and shall be subject to all the duties, requirements and disabilities prescribed and contained in an act defining the general powers and duties of manufacturing corporations and several acts in addition thereto.

SECT. II. *Be It Further Enacted*, that the said corporation in their corporate capacity shall and may lawfully hold and possess such real estate not exceeding $100,000 and personal estate not exceeding $200,000, as may be necessary and convenient for carrying on the manufacture of glass in the place aforesaid. As of February 22, 1826.

The site of Sandwich, then a little village lying at the foot of Cape Cod, between Buzzard's Bay on one side and Cape Cod Bay on the other, was selected because of the abundance of virgin timber for fuel in this vicinity. The first agent whom Jarves sent to Sandwich in 1824 is said to have overstepped the bounds by contracting for a much larger acreage of timber-land than had been planned, the cost of this additional land necessitating a larger capitalization than originally contemplated. In all, the company owned twenty-two thousand acres of forest.

Ground for the buildings was broken in April, 1825. The site of the glass-house proper lay on the bank of a creek, navigable by small boats or scows when the tide was in. Boston was fifty miles distant by water. Jarves planned to utilize this water-route for transporting his product. Building operations were soon flourishing. Furnace and pot buildings were erected, homes for the glass-blowers were built near the works; practical artisans were sent for from Europe, while

other workers prepared to leave the Cambridge plant for the new enterprise. The gray-colored cottages of the employees were soon made attractive with flower gardens; elms were planted along the newly laid out streets; frame houses of dignified simplicity, painted white, and green-shuttered, arose in the heart of the village, for the superintendent and managers of the plant. Beauty combined with the furnaces of industry to make a model town of the place—a fact worth recording because it is exceptional.

Nearly every available farmer in Barnstable County was hired to fell, haul, and cut the pine logs. The sandy or swampy condition of the cape precluded a prosperous agricultural living for the rural population, and log-cutting soon became the leading source of revenue in the county. Roads had to be made through the clearings, ox-teams laboring over the almost impassable stretches.

Local sand could not be utilized on account of the prevalence of iron in the silica. A small portion for the inferior-grade articles was hauled from Plymouth beach, but the greatest part came by boat from the Berkshire and Maurice River beds. The pearlash, nitrate of soda, and saltpeter were also brought in by water until the completion of the railroad from Boston. Vessels were soon plying between Boston and Cape Cod Bay, bringing in raw materials and taking away the finished product. When the tide was in, the flat-bottomed scows came down the shallow creek from the boats in the bay to the factory. The depth of the channel was constantly changing, sand-bars formed continually, and dredging was ever necessary. Finally a course was cut through the marsh-land for the heavier supplies, and a little summer railway was erected from

the works to the port at the harbor. The sloops *Polly* and *Osceola*, and in later years the steamer *Acorn*, did valiant service. The *Acorn* was sold to the Government at the outbreak of the Civil War, and was sunk off the capes of Virginia.

The Old Colony, or Boston and Sandwich Railroad, completed in 1848, was the first freight-transportation system of its kind in America. After a few years, feeling that they controlled the situation, the officers of the road increased the freight rates until the latter became prohibitive. The Sandwich people rebelled, and put the *Acorn* into service. Then an adjustment was effected with the road's officials, and the little steam-engine was soon hauling coal from Buzzard's Bay to the factory, about nine miles distant.

Until 1849 there was but one glass-house or furnace house at Sandwich, with five crews or "shops" operating it. The furnace contained eight pots, each pot holding eight hundred pounds. The monthly "melts" amounted to twenty-seven thousand pounds and were valued at approximately $75,000 annually.

The first glass was blown on Independence Day, July 4, 1825, by Charles W. Lapham, the English-born superintendent of the works. Entries of products for this summer include: "Six inch round dishes, heavy plain ink wells, 5 inch molded patty pans, button stem short lamps, common pungeons, flint champaigns, molded salts for cutting (blanks), molded mustard, Liverpool lamp glasses." Another list for 1825 includes the following: "Tumblers, cruet stoppers, moulded hats, toy decanters, twisted cruets, common salts, pint pocket bottles, ½-pint mold jugs, 5-inch mold patty pans, star and ball stoppers, chamber and high-blown stem lamps, lamps on foot and peg lamps."

The "Columbian Centennial" (a Boston paper) for November 9, 1825, published the following advertisement:

> The inscriber informs his friends and the public that his Flint Glass Manufactory in Sandwich is now in full operation and is ready to receive and execute orders for any article in that line—particularly Apothecaries, chemical and Table Wares, Also Chandeliers for Churches and Halls, Vase and Mantel Lamps, Lamp Glasses, and all other articles usually made in similar establishments, and on as favorable terms.
>
> Orders directed to Sandwich, Mass. will receive prompt attention.
>
> DEMING JARVES.

This is the first indication that chemical apparatus and apothecary's supplies were being made. The scope of manufacture was wide—from retorts to chandeliers!

The most momentous day in the history of the industry was April 20, 1827, when Robinson's pressing-machine, improved somewhat by Jarves and his workmen, was installed and first operated by Patrick Swansey, the first article pressed being a tumbler. This tumbler, after remaining in the possession of Jarves for many years, passed into the hands of John Dobson, a glass-dealer of Baltimore. At the Philadelphia Centennial of 1876 it was proudly exhibited by Hobbs, Brockunier & Co. of Wheeling, when Hobbs, taking it from a case to show an admiring audience, accidentally let it fall to the floor, shattering it into a hundred pieces. Hobbs, who had followed all the stages of the pressing-machine, from its invention to its perfection, was disconsolate.

The first foreign workmen at the factory were nearly

all Englishmen, followed very shortly by expert die-makers and blowers from France and Belgium. On the roster of employees for 1825 we find the names of Isaac Fessenden, Samuel Kern, William Lapham, C. Lapham, Joshua Crosby, John Doyle, Michael Doyle, Samuel Lloyd, Benjamin Lloyd, Benjamin Haynes, John Scott, Benjamin Tewkes, Alford Green, John Snowdon, and Arratt. The Laphams were engravers; Edward Swan was a painter of flowers—a "master decorator" or enameler; Packard was a glass-cutter; Chapoul, the bookkeeper Dillaway, the mold-chipper, Mathews, Lutz, Quinn, Lovett, Grady, and Kenney were " gaffers," or foremen. The "starters" were Englishmen and Germans. Many of these men later emigrated to the West.

The firm was soon yielding an average return of six per cent on the original investment. Wages in the early days were as follows:

Gaffers	$14.00 to $17.00	weekly
Servitors	14.00	"
Toolmakers	6.00	"
Blacksmiths	6.00	"
Wood-dryers	6.00	"
Laborers	6.00	"
Boys	3.00	"
Blowers	2.00	daily

Captain William Stetson was assistant manager of the factory from 1825 to 1830; Theodore Kern, from 1830 to 1866; and George Lafayette Fessenden, familiarly known throughout the glass-industry as "Lafe" Fessenden, took Kern's place. In later years Sewall H. Fessenden acted as the Boston agent.

During the forties and fifties, the company pur-

chased additional ground for warehouses. Like many of its competitors, the Sandwich concern did little advertising. The grade of glass made by the firm was of the best, barytes earth being used in the metal. The designers were equal to any in the country, in artistic merit, and superior to those of several of the smaller houses. The output was extremely diverse, as regards types, form, and color, the Sandwich opaque colorings, "marbled" and other bicolor and tricolor combinations being the most prolific in America. Glassware to fill any want and to suit any taste was manufactured between 1825 and 1860. In the spring and autumn of each year, large consignments of goods were shipped by the firm to New York city, where the glass was sold at auction to jobbers gathered from all parts of the country. When trade fluctuations occurred, which sent many houses to the wall, the Sandwich company, with its large financial resources, stored the production in its warehouses, kept on blasting, and waited for the better day.

In 1858, Deming Jarves and one of the other prominent officials, James D. Lloyd, left the Sandwich company and established a rival glass-works close by, mention of which is made in another part of this chapter.

The Fessenden family really managed the destinies of the Sandwich works during its most prolific period. The reorganized firm enlarged its furnace capacity, sent abroad for additional workmen, imported the most advanced etching-machines, and produced a very large output of ruby glass after the Bohemian manner. Quantities of fine opalescent "hold-backs" were made, and thousands of lamps with white opaque or opalescent standards. Gilders, cutters, engravers were set to work

at new benches and wheels. Competition with the Pittsburgh houses became more keen.

The outbreak of the Civil War gave the apprentice boys their chance. Their elders gone, they manned the works. Production naturally slowed down for five years, but the labor shortage equalized matters. Every soldier who returned in crippled condition was somehow kept upon the pay-roll by the beloved "Lafe," work of an easy or minor sort being found for him. Those who were injured in their work at the factory were also given easier tasks, and no man was ever discharged or turned away except for good reason.

George Lafayette Fessenden, who is said to have possessed some of the splendid qualities of the two heroes for whom he was named, either died or resigned in 1882, after having held the destiny of the Boston and Sandwich company in his hands for a quarter of a century. As is true of many another glassman, his praises have not been sufficiently sung; I sometimes wish we had more "Lafe" Fessendens in bronze or stone in our parks, and fewer Apollo Belvederes.

After Henry V. Spurr took the managerial reins, one misfortune after another beset the place. Pittsburgh and Ohio had gained control of the pressed-glass market, fuel conditions enabling the houses in these sections to produce glass at a lower cost. The patterns and the grades of glassware had also degenerated, breaking free from all restraint and canons of good taste; the general standard of the ware was slipping backward. Then a storm of labor troubles fell with sudden but terrific force upon the Sandwich house, completely engulfing it.

We lack space to recount the details of this labor war. The merits of each side (for there were two, of

course) must be thoughtfully reviewed before one can reach a just conclusion. The great glass strike of 1887 and 1888 does not belong to the chronicles of early American glass, but it forms a living page in the industrial history of our country. Old systems were disrupted, and passed forever. Many an affluent glass-house failed, the Flint Glass Makers Association becoming powerless in the enforcement of the wage scale.

In the midst of turning out a very important order for lamps, parts of which had already been assembled, the Sandwich glass-blowers were ordered by their union to go on strike. The loss of the lamp order meant thousands of dollars. The blowers refused to listen to reason or the importunities of the company officials. Exasperated, the management then issued this ultimatum: "If the fires are allowed to go out, they will never be relighted." It was the crisis. The workers struck; and the fires under the furnaces were never rebuilt.

The town of Sandwich was greatly affected by the consequent stagnation. The charter of the company dissolved automatically on March 6, 1894, when all stored goods on hand were sold to the manager of a chain of five-and-ten cent stores. Parts of lamps, candlesticks, compotes, bottles, etc., were consigned to an enormous junk-heap.

During the sixty-two years of operation of the furnaces, the Sandwich output has been computed at a value of $30,000,000. The New England States and New York State were the chief consumers, but the ware went to almost every foreign port open to trade with America for over half a century.

Attempts were made to reopen the factory, but none

of these proved successful. In 1905, Cardenio King purchased the site, re-melted the piles of imperfect, broken, or discarded glass, and produced a brownish glass mixture of little merit. He failed. Debris of all kinds now litters the abandoned place, deep pits filled with stagnant water and covered with weeds and wild flowers yawn for the unwary seeker of Sandwich-glass fragments. A rusted anvil stands in a dilapidated shed, mute testator to the tragedy which occurred on New Year's day in the year 1888.

The diversity of the Sandwich output is amazing. A volume of the same size as this would be insufficient to describe the various articles in detail. Thirty-eight-pound punch-bowls; little purple and blue canary-bird boxes; miniature blown and pressed children's playthings; delicate, lacy lamps; huge, lugubrious lamps; exquisite dainty vases of every form and pattern conceivable; heavy pressed celery-holders, without one redeeming feature; insufflated glass of great delicacy and beauty, including oval nine-inch dishes; blown light-green sugar-bowls, with applied cable-like design; enameled opalescent mugs after the Bristol manner; mercury blown mugs, candlesticks, and balls, in imitation of the silver; gimmal-flasks which cannot be distinguished from those of Nailsea; cut glass greatly resembling that from the Stourbridge district of England; ruby glass of the finest grade which defies the collector to say that it is not Bohemian; etched-glass goblets and vases like the German; pressed goblet and plate patterns which cannot be distinguished from those turned out by Launay, Hautin, et Cie of France etched flips and tumblers identical in design with the Spanish —these are but a part of the complete catalogue!

Meeting a well-informed woman whose home has always been in Sandwich, I told her that one of my friends hoped I would correctly list and catalogue the output of the Sandwich factory. We both laughed. There was a day when she contemplated listing, describing, and photographing the authenticated cup-plate patterns made in her home town. After she had passed the three-hundred mark (listing, not photographing), she felt the field was so beyond the capacity of one booklet that she stopped.

The great handicap in listing patterns known to be made at Sandwich lies in the fact that *they were also made at other contemporary flint-glass houses.* With a few exceptions, we do not know what manners, forms, and designs of glass were made *exclusively* by Jarves and Fessenden, or which *originated* on the Cape. I have seen a disclaimer for nearly every claim of all-inclusiveness.

Those who scoff at Sandwich glass do not realize that between the years 1825 and 1845 some of the finest blown glass in America was made by this house. Little pressed ware was produced for commercial use before 1838, and the earlier lacy patterns emanating from the single Sandwich furnace are in the main fit companions to the blown ware on the collector's shelf.

Mr. Bunker of Sandwich has an interesting specimen showing the manner in which stoppers were molded. The mold is circular, twenty stoppers being cast or poured into the central disk, forming a complete circle around it. After removal from the machine, these stoppers were cracked off from the central disk, and the lower part ground down to proper size.

Gothic or arched patterns in pressed glass, which are among the best designs produced at Sandwich, and

which are usually seen in sugar-bowls or covered sweetmeat-jars have been found in clear glass, opalescent and opaque white, cobalt, and robin's-egg blue, amber, purple, and (very rarely) canary and rose; only a few pieces of the rose are known.

One of the expert metal-mixers, Christopher Muldoon, had learned his trade at the Cambridge works. He superintended each mix at Sandwich, extracting a sample of the fused material, first testing and then blowing and shaping it carefully. He invented all sorts of fanciful forms in making these tests, often giving the results to his friends. These test pieces, of which there are no duplicates, frequently turn up to confound us. The Sandwich Historical Society owns several marvelous pieces of blown glass, unlike any others accredited to Sandwich, which have been donated by residents of the town and which may logically be test examples of Muldoon's. Many of his pieces were cut, others were fashioned after the Italian manner. After the plant was closed, Muldoon moved to Somerville, New Jersey, and became associated with the Union Glass Works. He died in 1916, at the age of seventy.

Deming Jarves attempted to use opaque glass for tessellated and ordinary floorings and pavements, believing until experimentation proved otherwise "that it may be rolled into sheets, as in iron or lead, now in use." Incidentally, one of the Zanesville glass-houses tried to make glass tiles for fireplaces, but the tiles were found to crack from the heat when in the hearth.

The flint-glass of Sandwich prior to 1845 was too hard to cut well.

When glass shades came into use, Sandwich made at least fifty different patterns of this article.

At least four hundred different shapes and designs

of lamps were made at this house. This number is very conservative.

A collector might have three hundred varieties of Sandwich salt-cups, and two hundred varieties of candlesticks.

Opal lamp shades and many opal lamps were blown. The shades measured from six to sixteen inches in diameter, and were very difficult to make. Ruby lantern globes were also manufactured.

For a few years, during the mid-nineteenth century, the Sandwich works turned out five hundred tumblers during every five-hour shift.

During the heaviest period of production under the Fessenden management, from three hundred to four hundred men and boys were employed, the wages averaging from $4.00 to $6.00 a day for the men.

Colored glass first became popular about 1835. Previous to this, with the exception of cobalt (sapphire), little colored ware was blown at Sandwich. Nearly all of our cobalt glass of the first quarter of the nineteenth century was blown in the Pittsburgh district.

It has not been definitely ascertained if the fine cobalt decanters of insufflated type were blown at Sandwich, at Cambridge, or at both places.

The ruby of Sandwich was made from the purple of Crassus, which was produced from gold coins most accurately measured.

Opaque glass was produced very early at both Sandwich and Cambridge. Considerable cobalt, purple, and opaque glass blown at these two houses in the thirties and forties has been incorrectly accredited to Stiegel.

The "Banker's Ink," an ink-well which gained great popularity all over the country, was in the form of a cubical block, six inches square. A small depression or

well for the ink was made by the plunger. It was of highest-grade metal, and every workman in the place managed to have one in his own home.

Sandwich used every color employed in glass-making in America, including canary, peacock-blue, citron, and a peculiar opaque shade appropriately called "dove."

To quote Walter A. Dyer:

> It is impossible to distinguish a piece of Sandwich glassware from other pressed glass except by knowing something of the history and source of the piece in question. . . . Exquisiteness of design is seldom, in so far as may be ascertained, a characteristic of Sandwich glass.

Charles M. Stow says:

> Unfortunately the absence of marks on the Sandwich factory's product has brought about a condition as to attribution where one collector's guess is as good an another's. It is undoubtedly true that much of the glass sold as Sandwich was made in the New England Glass Company's factory at East Cambridge, much of it came from Ireland and England, some of it was made in Pittsburgh, and some of it in factories still farther west, in Ohio and Kentucky.

Immediately after their separation from the Boston and Sandwich company in 1858, Deming Jarves and James D. Lloyd erected a new glass-works of their own near the Sandwich plant. Built primarily for Jarves's son John, the industry started with every apparent prospect of success, being equipped with the most up-to-date machinery. Jarves offered higher wages to his workmen than the prevailing scale at the Sandwich works. He also sent to England for the most

experienced glassmen, Nehemiah Packwood and John Jones coming from the Stourbridge district. Jones, an expert designer, remained but six months with the Cape Cod company, going over at a reduced salary to the "B. & S."

John Jarves died shortly after the industry had started; and Deming Jarves, now an old man, lost all heart in the enterprise. The Civil War also had disastrous effects upon the works. Deming Jarves died April 15, 1869, in his seventy-eighth year, and the company died with him. Many of the workmen migrated to Pittsburgh, Wheeling, and Ohio glasshouses.

Dr. Flower later took over the buildings, making fanciful vases, paper-weights, and other ornamental glass called "vassa-murrhine" or "vasa-marina"—usually a varicolored ware, much given to crinkly edges, grotesque shapes, and other features in accord with the popular taste of the seventies. In 1882 the factory was purchased by Charles W. Spurr, who used it as a veneering plant. Later the buildings fell into disuse.

During the ten years of operation of the Cape Cod house, under Deming Jarves's régime, considerable glass must have been produced. Next to nothing has been written about this factory.

CHAPTER XXXVI

THE FEDERAL HILL AND SPRING GARDEN WORKS IN BALTIMORE

Baltimore's first glass-industry grew out of an attempt to rehabilitate the fortunes of the Amelung family and their workmen. After the complete collapse of the New Bremen works, which he had founded, John Frederick Amelung and his family moved to Baltimore, where he suddenly died on November 20, 1798, at the age of fifty-nine. About this time, or shortly after, one of his sons, in company with some of the New Bremen workmen, went on foot over the Alleghanies to the new Pittsburgh glass district, and entered the employ of O'Hara & Craig. Another son, Frederick M. Amelung, in 1797 married a daughter of Alexander Furnival, a prosperous resident of Baltimore, and soon thereafter interested his father-in-law in the plan of establishing a glass-works in that city. A plot of ground lying at the foot of Federal Hill, facing Hughes Street and the Patapsco River basin, was leased from George Presstman in November, 1799, and a factory for glass-making was erected on the site. This plant was variously known as the Federal Hill Works, the Patapsco River Glass-house, and the Hughes Street Works. The first firm-name was Frederick M. Amelung & Co. A considerable share of the business was owned by Alexander Furnival.

According to Mr. Hilgenberg, president of the present-day Carr-Lowry glass-factory, it is doubtful if any

of the earlier glass-works of Baltimore were incorporated. They were, for the most part, informal organizations.

The younger Amelung proved no more successful in managing a glass-house than his father before him. On August 11, 1802, the partnership was dissolved by mutual consent, Furnival and Jacob Amshurst (or Anshurtz) being appointed joint executors. On November 5, 1802, the works were assigned to Philip R. I. Friese. In 1804 the property was sold at bankrupt sale by John L. Friese, son of Philip Friese. Despite this sale, John Friese does not seem to have lost control of the factory, for there is evidence that he was still making window-glass there in 1822, 1823, and 1824. Also, according to his will and codicil, drawn December 21, 1827, and approved December 17, 1830, he was still a part owner of the works at that time. Under the Friese régime the factory was enlarged, fifteen new houses were built for the workmen, and the company bought additional wooded tracts for fuel.

The data regarding early Baltimore glass-production have offered difficult problems for every one who has attempted to search for and systematize them. I am indebted to Mr. Homer H. Howard of Mansfield, Ohio, and Baltimore, and to Mr. Walter B. Swindell, senior member of the Swindell Brothers Glass Works of Baltimore, for the greater part of my information upon the subject. The Swindell family have been closely identified with the glass-industry of Massachusetts, New Jersey, and Baltimore for many years.

The Reppert family, the older members of which came to Maryland with the elder Amelung, were doubtless associated with the Federal Hill Works from its inception. It is believed they saved the factory from

bankruptcy proceedings by putting in enough capital to become half-owners with John Friese.

The will of John Friese states: "If my nephew, Frederick K. Schetter, cares to carry on the glass works now conducted under my name but in which George and Jacob Reppert are interested to the extent of one-half, he can take it at a fair valuation." The nephew's stand in the matter was to be decided within three months after Friese's death.

The Reppert family, it should be said, consisted of three brothers: George, who became manager of the Federal Hill Works; and Jacob and Lewis, who became glass-blowers at this works. A fourth brother, or an uncle, had joined the Gallatin-Nicholson-Kramer firm at New Geneva and Greensboro, his children and grandchildren learning the business. By 1831, George was part proprietor of the Federal Hill Works. Frederick and Lewis Schaum, also of Fredericktown tradition, were glass-blowers at this plant, and later became connected with the Repperts as owners of the works. Mr. Swindell remembers hearing his father state that the Repperts and Schaums were associated in the business.

It seems that the Schaums next became the directing spirits of the Federal Hill Works, although the firm was known for a short time as Everhart & Schaum. Later, Everhart took over the window-glass part of the business, and the Schaum brothers the bottle-making branch. In the picture of the Baltimore factory, reproduced on page 193 of Van Rensselaer's "Early American Bottles and Flasks," the building running back toward the harbor from the street, at the left, was the part used by the Schaums for the bottle-making business, which was considerable.

The building to the right, also running from the street to the harbor, became the window-glass department. The central connecting building facing Hughes Street is a later addition. Mr. Swindell is of the opinion that the Schaum-Everhart partnership in this separate, yet united, industry began as early as 1840.

William Swindell, the father of Walter B. Swindell, came to Baltimore from the Cains Point glass-works, then near Camden, New Jersey, but now within the city limits. After arriving in Baltimore, he worked as one of the flint-glass blowers for F. & L. Schaum, making glass lamps and all sorts of fancy glass goods. During the time he worked there, the flint-glass part of the industry gradually decreased in volume and importance, and the green-glass or bottle department greatly increased. In his spare time William Swindell learned the green-glass bottle processes; and when the Schaums told him that the flint-glass business had dwindled to such an extent that they could not employ him longer, he surprised them by proving that he could be a competent workman in bottle-making as well. He began his connection with F. & L. Schaum about 1845.

At this time the Schaums were making large quantities of bottles and flasks for Baker Brothers & Co., commission merchants and wholesalers in the paint, oil, and glass trade on Charles Street. In the great Baltimore fire of 1850, their two large warehouses on this street were destroyed, entailing a loss of $75,000. They soon rebuilt the warehouses, and in the same year established a branch house in New York, H. J. Baker & Brothers becoming one of the leading wholesalers in that city dealing in paints, French plate-glass, and chemicals.

At the time the Schaums were supplying the Bakers

with bottles, the boss-blowers of the works were making such high wages (for that day) that they scarcely knew what to do with their money. A group of these blowers decided that they might as well have a bottle-works of their own. The plan was a coöperative one, in which the owners were also to be the workers. By this plan they hoped to undersell the Schaums. With the money they had saved in several very prosperous years, during which the bottle-business had grown by leaps and bounds, they put up a factory at the foot of Eutaw Street in 1850, calling it the Spring Garden Bottle Works, and selling their output exclusively to Baker Brothers & Co. William Swindell was among this group. At first harmony prevailed, the officials actually worked at the making of glass, and everything succeeded beyond expectations. But with increasing prosperity some of the men began to long for easier jobs instead of the hard labor of blowing bottles at the glass-works. After three years of great success, they concluded to sell their flasks themselves instead of marketing them through Baker Brothers & Co.

Schaum, on the other hand, had met with reverses after the loss of his best workmen. He failed, and had to close the factory—at least that part of it devoted exclusively to bottles. This section of the plant was thus lying idle when one or both of the Schaums joined the Spring Garden works, one becoming manager. This radical change probably took place about the time that the original founders decided to give up active work in the plant.

William Swindell felt that the plan of the Spring Garden company to sell direct to the consumer instead of through Baker Brothers & Co. would be a flat failure. The Bakers had an established business, not only

for the bottles and flasks made at this factory but for tumblers, wine and porter bottles, druggists' glassware, etc. Swindell therefore went to the Baker company, informing them of the plans on foot to withdraw the Spring Garden output. The Baker company saw that they would be greatly handicapped if the plan was put through, as it would completely cut off their supply of certain types of bottles and whisky-flasks. At this time there was evidently no other bottle-works in Baltimore from which they could draw a steady supply.

After the Schaums closed the Baltimore works on Hughes Street, Baker Brothers & Co. bought the property. Just why the Bakers took this step is not known. Possibly the plant was wanted for storage space; more probably, they felt that they could sometime utilize its furnaces for their own manufacturing purposes if the great demand for bottles continued. It should be remembered that this was the era of pocket whisky-flasks and patent-medicine consumption; snuff-taking was on the wane, but shoe-blacking bottles and ink-bottles were purchased by the thousands. At any rate, coincident with the report from Swindell that the Spring Garden owners were about to adopt a new policy in marketing their output, the Bakers took over the idle works at the foot of Federal Hill. Swindell proposed that they reopen the plant under his management if the Spring Garden plant withdrew its supply from the jobbers, also agreeing to put capital into the factory. After quietly inquiring into Swindell's story to see if it was true, the Bakers accepted his proposal to become manager of the old Baltimore works. Thus in 1853 the firm of Baker Brothers & Co. embarked upon the business of making bottles and glassware.

The Spring Garden people, in carrying out their

plan, found no trouble in getting orders for their bottles, as their prices were low and the grade of glass satisfactory. They were also willing to sell and make deliveries on a time basis. Such extension of credit proved the undoing of many a manufacturer in the 1855-65 period, and brought about the downfall of the Spring Garden concern, bills due becoming absolutely uncollectable. The enterprise failed; the Baker concern bought it out, and from then on operated both the Hughes and Eutaw Street plants, buying the window-glass department of the factory from Everhart. Additions and improvements were made.

During the time Swindell was associated with Spring Garden, he was one of the first men in the East to experiment with the use of coal as fuel for melting the mix. The coal used was brought from the Cumberland (Maryland) district. Previously, wood had of course been the fuel, with rosin from the North Carolina pine district added to give a more intense heat.[1] The basin offered splendid receiving facilities for this rosin, which was brought from the Carolinas in barrels up the coast, and unloaded from the ships directly to the wharf of the factory. It was an inexpensive fuel-intensifier, but the excessive heat produced from the rosin tended to crack the pots. At first only a small amount of coal was combined with the rosin, but gradually the proportion of coal was increased and of rosin decreased, until the latter was entirely eliminated. This gradual change of fuel was similar to that at the Sandwich plant. Many of the bottles which we now collect were made under the Baker ownership of these two glass-works.

[1] The term "rosin-monkey" originated when rosin was adopted for the glory-holes, this "monkey" being the agile youngster who fed the rosin into the furnace.

As nearly as Mr. Walter Swindell can judge, little commercial blown ware, tableware, or fancy glass was made in Baltimore after the Schaums went into the bottle-business. For a time bottles were the chief glass product of Baltimore. Then came a period in which window-glass engaged the entire attention of the plants. Now no window-glass is made there, the two present-day factories making bottles exclusively.

The Swindell family possess three beautifully blown flint-glass decanters, elaborately cut; but they feel sure that their ancestor, William Swindell, made them while at the New Jersey factory, before he went to Baltimore. They also own a green bottle-glass witch-ball on an urn-like pedestal, which they attribute to New Jersey rather than Baltimore, although they are not so positive about this as in the case of the decanters.

The Baltimore glass-works and the Spring Garden works each turned out flasks which to-day are in some instances very common, and in others very rare; the unusual colorings occasionally met with in the Baltimore production have considerable to do with their scarcity and value.

Among the Baltimore glass-works output may be found the following flasks:

Corn for the World; reverse, Baltimore Monument
Corn for the World; reverse, Zachary Taylor
Washington with queue (left); reverse, Baltimore Monument
Washington with queue (left); reverse, Zachary Taylor (left)
Washington with queue (right); reverse, Zachary Taylor (right)
Major Ringgold; reverse, Zachary Taylor
Captain Bragg; reverse, Bunch of Grapes

Federal Hill and Spring Garden Works

Captain Bragg; reverse, Baltimore Monument
Cannon; reverse, Baltimore Monument
Cannon; reverse, Bunch of Grapes
Anchor and Rope; reverse, Sheaf of Grain

The very rare clear-glass pint straight-necked "Locomotive (engine) and tender; reverse, allegorical figure bearing inverted horn-of-plenty," is accredited to this house by Stephen Van Rensselaer, who believes that it was probably made to commemorate the completion of the Camden and Amboy Railroad. This was the first steam railroad to operate in America, being given a charter by the State of New Jersey on February 4, 1830. The engine was brought from England, was assembled and put into service November 12, 1831, and was called the "John Bull." Only three specimens of this flask are known to date, and it is unquestionably one of the rarest and most desirable flasks made in this country.

The Baltimore company made many half-pint flasks. Among the colorings found in its bottles are the following: Aquamarine, grass-green, emerald-green, blue-green, yellow-green, puce, claret, amethyst, sky-blue, cobalt, ultramarine, light sapphire, and various shades of amber. The flasks made at the Spring Garden works were, in the main, similar to the Baltimore glass-works output.

John Lee Chapman erected the Maryland Glass Works, a bottle-house, on the corner of Lancaster and Caroline streets, Baltimore, in 1849. Window-glass also was one of the products. Chapman was a prominent citizen who served the city of Baltimore in many capacities, becoming mayor in 1864, at which

time his brother Jonathan acted as manager of the glass-works. Chapman made the well-known flasks, "Sailor, reverse Musician," "Soldier, reverse Dancer," "Horizontal Barrel, reverse plain," and the "Phœnix-Resurgam" group which was undoubtedly made in 1850 and 1851 as a souvenir of the great Baltimore fire of 1850.

CHAPTER XXXVII

BAKEWELL'S OF PITTSBURGH

George Robinson, a Scotch carpenter, and Edward Ensell, an English glass-blower, began construction of a glass-house at Pittsburgh in 1807, but lack of sufficient funds compelled them to abandon the project before the buildings were completed. Thomas Bakewell and his friend, Benjamin Page, two new arrivals in the Western town, from Derby, England, became interested in the project. They bought the plant, added the necessary equipment, and engaged Ensell to superintend production. It is thought that the latter had an interest in the firm until 1809. Thomas Kinder also owned stock in the new company for a brief period; Robert Kinder (probably a brother) was the company's commission merchant in New York.

The first flint-furnace of this concern was a little six-pot affair, the crucibles measuring but twenty inches in diameter. In 1810 a ten-pot furnace was added, and in the same year William Peter Eichbaum was engaged by the firm as glass-cutter. He cut the first crystal chandelier made in America, a beautiful piece of craftsmanship consisting of "six lights and shower upon shower of rainbow-casting prisms." It was sold to Mr. Kerr, an innkeeper, for three hundred dollars, and "hung suspended in his house for all to marvel at."

Bakewell and Page had many trials and tribulations during the earlier period of their operations. Both of their furnaces proved to be poorly constructed; the sand and the pot-clays had to be hauled from a distance at great expense, some of the better grades coming over the mountains from New Jersey and Delaware. Few workmen proficient in flint-glass blowing, or in etching, engraving, and cutting glass, could be hired, and the firm would not permit the introduction of the apprentice system; also, the demand for good glass did not equal the supply. During the War of 1812, shipping facilities became miserable, freight rates advanced, credit had to be extended to nearly every one, and collections were almost impossible.

In 1811 the proprietors moved the works from the banks of the Monongahela to more commodious buildings on the corner of Water and Grant streets, opening up a warehouse on Wood Street near Second Street. By 1814 business conditions had begun to improve, and another ten-pot furnace was added. Trade soon expanded in every direction, and "Bakewell's" became recognized as the largest flint-glass establishment in the western hemisphere. Its fame spread abroad. Elias Pym Fordham, in his "Personal Narrative of Travel" (1817), remarked that "Mr. Bakewell's works are admirable. He has excellent artists, both French and English. His cut glass equals the best I have seen in England."

An important event for Bakewell's occurred in 1817. President James Monroe, "swinging round the circle," came to Pittsburgh, visited the great flint-glass works, and was so pleased with its crystal-like ware that he ordered for the White House what the "Pittsburgh Mercury" of November 10, 1818, described as

Pittsburgh FLINT GLASS Manufactory.

BAKEWELLS & CO.

Have constantly on hand and offer for sale at their Works,

Corner of Grant & Water streets.

And at their Warehouse, corner of

Wood and Second Streets,

A general and extensive assortment of PLAIN, CUT, and PRESSED

FLINT GLASS-WARE,

Of every description, comprising amongst other articles

Bureau Mountings, Curtain Pins, Confectioners' Jars, Apothecary's shop Furniture, Canteens, cut and pressed Panes for steam boats, Bottles, Flasks, Vials, and

WINDOW GLASS.

And having made arrangements with the Eastern Manufacturers, are constantly receiving a supply of

Astral, Table, Mantel, Hall & Steam Boat

LAMPS,

With plain, obscured, and fancy cut shades.

Brittannia, Japanned and German Silver

CARTOR FRAMES,

With plain, figured, and cut Bottles.

All of which will be sold on the most accommodating terms.

a splendid equipage of glass . . . consisting of a full set of Decanters, Wine Glasses and Tumblers of various sizes and different models, exhibiting a brilliant specimen of double flint, engraved and cut by Jardelle, in which this able artist has displayed his best manner, and the arms of the United States on each piece have a fine effect. The glass itself must either have been selected with great care, or the spirited proprietors must have made considerable progress in their art, for we have seldom seen any samples so perfectly pellucid and free from tinct. Upon the whole we think the present service equal, if not superior to the elegant Decanters presented to the President when he passed through Pittsburgh last year.

When Henry Bradshaw Fearon traveled in America, he also stopped at this Western metropolis, visiting, as did all foreigners, the establishment of Bakewell's. He later recorded his surprise

to witness such perfection on this side of the Atlantic, and especially in that part of America which a New Yorker supposes to be at the farther end of the world. At Messrs. Page & Bakewell's glass warehouse I saw chandeliers and numerous articles in cut glass of a very splendid description; among the latter was a pair of decanters, cut from a London pattern, the price of which will be 8 guineas. It is well to bear in mind that the demand for these articles of elegant luxury lies in the western states! the inhabitants of Eastern America being still importers from the Old Country.

Similar praise is expressed by Thomas Nuttall in "A Journal of Travel into the Arkansas Territory" (1818):

The day after my arrival [in Pittsburgh] I went through the flint-glass works of Mr. Bakewell, and was surprised to see the beauty of this manufacture, in the interior of the

United States, in which the expensive decorations of cutting and engraving (amidst every discouragement incident to a want of taste and wealth) were carried to such perfection. The productions of this manufacture find their way to New Orleans, and even to some of the islands of the West Indies. The President, Monroe, as a liberal encourager of domestic manufactures, had on his visit to those works given orders for a service of glass, which might indeed be exhibited as a superb specimen of this elegant art.

Albert Gallatin, in his "Report on Manufactures" (1810), states that "the recently established works at Pittsburgh were cited as the only works of the kind in the United States, and were described as, even then, making decanters, tumblers, and every other description of flint-glass of a superior quality."

Deming Jarves, in intimate touch with the glass-industry in all its phases, writes in his "Reminiscences of Glass-Making":

We may well consider Mr. Bakewell as the father of the flint-glass business in this country; for he commenced the work in 1808, and by untiring efforts and industry brought it to a successful issue. For the skill, judgment, labor and perseverance devoted by him to the progress of the art, he truly merits the *Artium Magister* so often bestowed on those least worthy of its dignity and honor.

Weeks, in his Census Report, remarks: "There can be no doubt that Mr. Bakewell is entitled to the honor of erecting and operating the *first successful flint-glass house in the United States.*"

The red-letter year for this establishment, in point of outstanding occurrences, was 1825. The Marquis de Lafayette's triumphal American tour of 1824 and 1825 was immortalized upon our vases, salt-cups, flasks, and other glassware. Accompanied by his son, George

Washington Lafayette, and his secretary, A. Levasseur, he visited Wheeling, Greensboro, and Pittsburgh, meeting several glass-manufacturers. Albert Gallatin entertained him at Friendship Hill; he held a happy reunion with Dr. Brunot in the latter's river-island home below the Point at Pittsburgh; and while in Pittsburgh he was conducted through the Bakewell establishment. Here he was presented with a pair of beautiful flint-glass vases, engraved with a view of LaGrange, his home in France, and with the American eagle. These vases were loaned by Lafayette's granddaughter to the French Commission for exhibition at the Chicago World's Fair in 1893. Miss Mary E. Bakewell, of Sewickley, Pennsylvania, possesses the note of appreciation which Lafayette wrote to her ancestor, in acknowledgment of the gift. It reads as follows:

Pittsburgh, May 31, 1825.

Gentlemen,

The patriotic gratification I have felt at the sight of your beautiful manufacture is still enhanced by the friendly reception I have met from you and by the most acceptable present you are pleased to offer me. Accept my affectionate thanks, good wishes and regards.

LAFAYETTE.

The Franklin Institute of Philadelphia awarded Bakewell's a silver medal for the best piece of cut glass displayed at the exhibition in 1825. During that year the plant's production was at its peak. Sixty-one hands were employed, exclusive of twelve engravers and ornamenters; $45,000 worth of goods was turned out; and the plant consumed thirty thousand bushels of coal. For a period of ten years, one employee blew six hundred tumblers daily, the firm doing a large business

in both cobalt and clear-glass tumblers in all sizes, with both plain and paneled surface.

The living-quarters of the workmen and their families were adjacent to the works, and much friendliness of intercourse was developed. Games and contests were staged; skating, swimming, and boating races were engaged in; the sick and the injured, the widow and the orphan were neither neglected nor forgotten. Conditions were, in a manner, ideal—similar in many ways to those which made for satisfaction at Sandwich.

The early output of Bakewell's was diverse, including pitchers, tumblers, decanters, wines, salts, flasks, cruets, sweetmeat-jars, candelabra, candlesticks, and chandeliers and lamps.

In 1825 the firm used Holland clay for crucibles. Its saltpeter until this year had been brought from the caves of Kentucky; from 1825 on for a few years it was imported from Calcutta, India.

The "Pittsburgh Mercury" in 1828 contained the following advertisement:

BAKEWELL, PAGE & BAKEWELL
Flint Glass Manufacturers
Have for Sale, an Assortment of
ASTRAL, OR SINUMBRAL LAMPS
On Pedestals and for Suspension
Also, Tuscan, Vase, Mantel and
Chamber Lamps
Which, in addition to their usual stock of
Plain and Cut
FLINT GLASS
Patent Moulded, Plain
and Cut
Bureau Mountings (etc etc)
Will be disposed of on the lowest terms.
Pittsburgh, November 20

During 1828, Benjamin Bakewell was called before the Congressional Committee on Manufactures at Washington, to answer under oath certain questions concerning the glass-industry of Pittsburgh. In his testimony he stated that in 1808 flint-glass tumblers were selling at $2.00 a dozen wholesale in Pittsburgh, but that after the currency became more stabilized they dropped to $1.00 a dozen. In 1828 they had gone down the scale still further, and were at this time wholesaling at 81 cents a dozen.

Mrs. Anne Royall, writing of the great Pittsburgh glass-works, which she visited in 1828, ecstatically exclaims: "Bakewell's is the place. Whoever wishes to see the blowing of glass done with ease and dispatch, let him visit this glass house. It stands in this city on the banks of the Monongahela, and the furnace has been in blast for five years; that is, it has never been out. Everything in the glass line is made. Every price. Every grade. Most beautiful to most plain." She continues:

> The admiration of this glass is not confined merely to home observers, but the great amount of it which has been exported testifies the reputation it enjoys abroad; and there is scarcely a stranger visits Pittsburgh, who is not desirous of taking a peep at Bakewell's Glass House. . . . The quality, variety, beauty and brilliancy of the endless piles of glass at Bakewell's is the greatest show I ever saw. Everything made of glass is found here,—and I would say, the patterns and clearness of the pieces, are equal, if not superior, to the Boston glass. It cannot be exceeded. . . . In the manufacture of this article Pittsburgh and the surrounding country enjoys an extensive reputation. . . . The glass of Pittsburgh, and the parts adjacent, is known and sold from Maine to New Orleans. Even in Mexico they quaff their beverage from the beautiful white flint of Messrs. Bakewell, Page and Bakewell.

Benjamin Bakewell, Jr., a grandson of the founder, was born in 1833, and in 1859 entered the firm, continuing as a partner until its dissolution in 1882. He is the Bakewell the old Pittsburghers remember in connection with the glass-industry. A volunteer soldier in the Civil War, he also gave much money to the Northern cause. In 1836 the firm, then composed of Benjamin, Thomas, and John Bakewell, took in John Palmer Pears as a partner, the house becoming Bakewell, Pears & Co., Ltd. John Pears remained with the company until his death in 1874. Thomas Pears, son of John and, I believe, a great grandson of the original Thomas Bakewell, became allied with the industry when a young man; his recent death has removed the last of this line of glass-makers.

The Bakewell industry ceased operations in 1882, after seventy-four years of existence—a longer lease of life than that enjoyed by any other American glass-house.

In 1836, Bakewell's specialized in "Apothecary-shop furniture, Hall lamps, Pressed panes for steamboats; britannia and Japan castors; cut bottles." Its cut glass became known as "Bakewell's diamonds," on account of the scintillant quality of the cut surfaces. During the forties the house seems to have made a little or much of everything, including apothecary sundries, confectionary jars, table-glass, bureau-knobs, mirror-knobs, curtain "hold-backs," decanters, carafes, lighting devices, lantern glasses, bar goods for river boats, colored ship's-glasses, perfume and unguent bottles, glass canteens, bottles, vials, and flasks.

This house probably turned out the greatest number of glass bureau-knobs or "pulls" in America. The majority of these, like the curtain "hold-backs," had pew-

ter pins. The knobs ranged from very large sizes to dainty pieces for small table drawers. The "hold-backs" and mirror-knobs cannot be distinguished from the Sandwich. Clear-glass, fiery-opal, milk-glass, canary, amber, green, and light-blue handles, "hold-backs," and mirror-knobs were manufactured.

The Bakewell glass was blown and hand-manipulated, blown into full-sized molds, or pressed mechanically. A great quantity of cobalt-blue glass was turned out during at least seventy years. After ruby became popularized, considerable "Bohemian style" glass was put upon the market. Nearly every form of decoration was employed at one time or another, including etching, engraving, cutting, enameling, gilding, and quicksilver filling. Many of the old Bakewell chandeliers and other lighting devices which are found in New Orleans, the West Indies, and South America, are to-day classified as French, Spanish, or English. Much of its early cut glass, especially decanters and wine-goblets cut by English experts imported from the English-Irish houses, is labeled as of foreign production; like similar ware made by Waterford workmen in the employ of the Cambridge house, it cannot be distinguished from its foreign prototypes.

In respect to both quantity and quality of output, the Bakewell house maintained for nearly seventy-five years a prestige equal, if not superior, to that of almost any other glass-works in America. It should rank as one of the six or eight most important houses in our early glass-industry. Yet next to nothing about this house had appeared in print, for the collector's purpose, until the publication in "Antiques" for March, 1927, of two articles, one written by Mr. Thomas C. Pears, Jr., and the other by myself.

CHAPTER XXXVIII

FREDERICK LORENZ AND WILLIAM McCULLY OF PITTSBURGH

After the death of James O'Hara in 1819, the Pittsburgh Glass Works was leased by Frederick Rudolph Joacim Lorenz, who (as we are just beginning to discover) designed and made some of the rarest historical flasks in the American category. Lorenz was one of the best men that ever walked on earth, and it is fitting that he should have glorified George Washington, William Henry Harrison, the emblematic eagle and log cabin on the bottles which he has left for the delectation of the very few. He was the maker of the "G. G. Washington, reverse Eagle on panel" flask. Bottle-collecting enthusiasts are now attempting to solve some of the riddles presented by Lorenz and his rare containers.

Born in Disellburch, Lippe-Detmold, Germany, June 10, 1794, Lorenz emigrated to America in 1809, landing in New York penniless at the age of fifteen. Four years later he walked to Pittsburgh, and went to work in the O'Hara factory. Although without previous experience in glass-making, he mastered with the greatest facility the finer points of the trade. At the age of twenty-five he had accumulated enough money and experience to purchase and manage the O'Hara works. During the same year (1819) he took over the plant of Trevor & Ensell, which had

been operating in Pittsburgh as a window-glass and bottle house since 1812. The output of both houses was soon increased under his judicious management. Quantities of bottles, flasks, apothecary's supplies, and other hollow-ware were blown. Lorenz, with a far-sighted grasp of affairs and conditions, realized the rapidity with which the Ohio and Mississippi river traffic was developing, and the effect which the new canal systems would have in populating the territory and affording better transportation facilities for glassware. He knew that the day of pack-mule and ox-team was soon to end.

Preparing for the increase in consumption which he foresaw, Lorenz built another glass-house in 1824, in the Sligo District of Pittsburgh, which then extended on the south side of the Monongahela River from the old bridge to Temperance Village on Saw Mill Run and Millersville on the Washington turnpike, and which had been settled by natives from County Sligo, Ireland. The works (called the "Sligo") was primarily for window-glass, but bottles and other hollow-ware also were blown, and it was operated as an adjunct of the O'Hara plant. A. W. Buchanan and Thomas Wightman later owned an interest in the business. When the firm dissolved in 1851, Lorenz and Wightman formed a copartnership, which continued for three years, until the death of Frederick Lorenz in 1854. Wightman then withdrew from active management, and the son of Lorenz, Frederick junior, ran the factory, retaining the old firm-name. The concern was variously referred to locally as Lorenz & Wightman, the Penn Glass Works, and O'Hara's.

In 1860 the property was leased to Fahnstock, Albree & Company. Fahnstock was a leading druggist

of the city and it is likely that the business was converted into an apothecary and bottle supply house for his goods. The company did not meet with financial success, giving up its lease in 1862, at which time Thomas Wightman, Moses Lorenz, and Alexander W. K. Nimick took over the management. The old firm-name of Lorenz & Wightman was again adopted. Moses Lorenz died in 1871, but the glass-works led an honorable existence as one of the leading manufactories in Pittsburgh until 1883, when Thomas Wightman & Company drew the fires for the last time.

Closely associated with Lorenz, Wightman, and the group connected with the old O'Hara works, was a young glass-blower named William McCully, who in time owned an interest in six or seven of Pittsburgh's glass-works. He was born in 1800, in County Antrim, Ireland, and was brought to America when a small boy by his parents, who built a cabin in Chartiers township, next to what was then called Jack's Run, on the outskirts of Pittsburgh. He had a meager schooling: but, like so many of the Irish who came to our country at the beginning of the nineteenth century, the boy quickly obtained a practical education. Receptive and energetic, he started in his teens to learn the glass-business.

He worked at first for Bakewell's, at the old Grant Street house, where he learned the rudiments of the trade and became a proficient blower of fine flint-glass. Next he entered the O'Hara plant, opposite the Point, for the purpose of learning window-glass and bottle making, working under the personal supervision of the kind Frederick Lorenz. In 1830 he formed a partnership with Captain John Hay, and built a glass-

house at the foot of Nineteenth and Railroad streets —Hay furnishing the greater part of the money, and McCully the technical experience. Everything was going along prosperously for McCully & Hay when a catastrophe wiped out the plant—the flood of 1832. which took costly toll of property in this section of the country. The glass-house was completely submerged, and carried away. Undismayed, McCully bought a little factory at the corner of Sixteenth and Liberty streets the following year, where he began operations in green and black bottle making, under the name of the Phœnix Glass Company. Although the elemental destroyer had been water, not fire, the "Phœnix" gradually arose and spread its wings until in 1838 it was one of the largest bottle-houses in the country. Not only did McCully help supply the mid-Western demand for bottles, but he exported large shipments of flasks by way of water-routes to the Southwest. Some of these bottles were actually as black as advertised. We recently owned two, early crude "Eagle, reverse Eagles," which were as the proverbial midnight. The Phœnix is said to have been the first glass-works west of the Alleghany divide to make bottles exclusively.

In 1834, McCully became interested in his third house, a window-glass factory at Monongahela City, his partner in this enterprise being William Ihmsen, of Williamsport and Pittsburgh glass fame. In 1836 the William McCully Co. was formed, with Lorenz as a partner and Buchanan owning stock. This "Sligo" plant, started in 1824, added Thomas Wightman as a partner. McCully also acquired an interest in the old O'Hara works, where he had learned cylinder-glass blowing. The O'Hara plant, under the name of

the Pittsburgh Glass Works, operated until 1851 under this combined management.

William Grace, one of the last stockholders in the old O'Hara plant, was the son of Mary McCully Grace. He took for his second wife Mary Lorenz. Grace was in charge of the window-glass house in 1844, and became one of the McCully firm between the years 1851 and 1860. John McCully, the son of William, entered his father's factories as a partner in 1850. In 1852, Mark Watson became a member of the firm; and John M. King joined the company in 1855. The elder McCully died in 1869, Watson and King then continuing the business.

William McCully was the first glass-manufacturer west of New Jersey to build a seven-stone wheel-oven, for flattening glass. It was put up by a workman named Klein, from one of the South Jersey glass-houses. He also introduced many other improvements into the business. William McCully's wife, Martha Zelley, a Quakeress from Mount Holly, Burlington County, New Jersey, was one of the best-loved women of Pittsburgh's earlier days.

The "Eagle, reverse Eagle over panel" flasks, which the Phœnix works turned out in great quantity between 1856 and 1866, may be found in half-pint, pint, and quart sizes, with straight or ringed mouths. The colorings are jet-black, brown, dark and light amber, all shades of green from very dark to light bluish green, aquamarine, sky-blue, and medium blue.

Under the brief régime of Fahnstock and Albree, the O'Hara works (then called the "Penn") probably turned out more marked flasks than any other bottle-works in the country in the same length of time, their favorite models being the "Union and clasped hands,

reverse Eagle" flask. This flask, with the "F. & A." stamp either in the panel or on the bottom of the bottle, is found in the regulation sizes, and I have seen the pints and quarts (but not the half-pints) in the following colors: light, medium, and deep blue, various tones of amber, various tones of green with the exception of olive and sage green. The metal in these marked flasks varies greatly. We own marked examples of a pint amber which is very heavy and coarse, a beautiful blue quart which is light and of fine metal, an aquamarine quart of medium weight and good quality—which prove that one cannot always identify a piece of glass by its metal, its weight, its color, or its general appearance.

CHAPTER XXXIX

THE McKEES AND JAMES BRYCE OF PITTSBURGH

The older members of the McKee family of glass-makers were born in Carlisle, Pennsylvania, around the beginning of the nineteenth century, and moved to Pittsburgh when they were children, the brothers who later entered the glass-making industry being Thomas, James, and Samuel. The last-named learned the trade as a boy, becoming proficient at cylinder-glass blowing. In 1834, Samuel and James built a window-glass furnace in the Birmingham district, about a mile south of the old part of Pittsburgh, James Salisbury being a third member of the concern. Two years later, Thomas McKee joined his two brothers, the three forming a family partnership under the trade-name of S. McKee & Co. They became real pioneers of the window-glass industry of Pittsburgh.

Bottles were also blown from the beginning of the works, and the business expanded so rapidly that after a few years the firm erected a separate bottle-factory between Twelfth and Thirteenth streets, which became one of the largest concerns in America in this field. While Samuel and Thomas were actively engaged in superintending the window and bottle glass houses, they started Thomas's five sons in the trade. These boys were Frederick, James, William, Sellers, and Stewart. They were taught the methods of flint-glass making; and in 1850 they launched a factory

for making this kind of glass, under the name of F. & J. McKee (Frederick and James being the elder brothers). The name was shortly changed to McKee and Brothers. Large quantities of tableware and pressed glass were manufactured by this firm, which in later years merged into Hogan, Evans & Co.

One of the elder McKee brothers married the daughter of C. Ihmsen. It is said that the McKee family learned their trade from the Ihmsens and the latter's workmen, who were of the Amelung-Maryland group. The early glassmen of the middle West fell mainly into two separate religious groups—the Lutheran and Reformed Church people from the Stiegel, New Bremen, and lower Jersey houses, and the Scotch-Irish Presbyterians. Intermarriage among these groups has caused numbers of our present-day glassmen to be descended from as many as six, seven, or even ten of the early technicians and glass-house proprietors. It is also worth noting that the standards of living were high among these families. They were an asset and a credit to the towns they founded or helped to build up. The Schoolcrafts, the Fosters, the Leightons, the Hobbses, the Bakewells, the Pears, the Stangers, the Hays, the McCullys, the McKees, the Kramers, the Gablers, the Swindells, the Fishers, and many other glass-making families added luster to the annals of their communities as well as to our glass.

Samuel McKee, born in 1808, became sole proprietor of the old McKee window-glass and bottle works in 1860, through the death of his brothers. Samuel died in 1877, and the works was taken over by Daniel and C. J. McKee and A. C. Dravo. The industry was very large, covering four acres, its output

including window-glass, druggists' supplies, black bottles, and telegraph insulators. The old house, last of its line, was destroyed by fire on May 5, 1911, being then owned by the Hartje estate, and used as a storage warehouse; two thousand eight hundred barrels of glass melted during the conflagration.

Another glass-making concern launched partially by McKee enterprise was Bryce, McKee & Co., which later became successively Bryce, Richards & Co.; Bryce, Walker & Co.; and Bryce Brothers. James Bryce, one of the founders of the house, was born in Scotland, November 5, 1812, being brought to America by his parents in 1818. They settled in Pittsburgh in 1819, and as soon as James was old enough to work, he was apprenticed to Bakewell, Page & Bakewell. The lad was then only ten, but industrialism and the crafts knew no child-labor laws a century ago. While it is repeatedly emphasized that Thomas Bakewell was strictly opposed to the apprentice system, nevertheless a number of our noted glassmen learned their trade from "B. P. & B.," as the concern was locally called.

Step by step young Bryce mastered the glass-trade. He did the smallest job well; efficiency and proficiency were stamped upon everything he attempted. The Bakewell house temporarily shut down between 1837 and 1840, during the panic and ensuing hard times of that period. Bryce ventured into the grocery business, but after his place was burned in the great fire of Pittsburgh in 1845, he entered the employ of Mulvaney & Ledlie, glass-makers on the South Side. Five years later he took the most important step in his career.

The year 1850 was an outstanding one in the eco-

nomic and commercial life of the nation. Theories regarding coöperative industrialism were being discussed all over the land. Groups of from four or five to ten or fifteen specialized workers or merchants were banding together as coöperative companies. The channels of trade were touching Western horizons; new methods and more capital were needed to launch the enterprises whose cargoes were to touch many hitherto unreached ports. Window-panes by the million, bottles for a hundred different uses, every sort of tableware, lamps, druggists' jars, glass domes for wax or hair ornaments, bar goods, clipper-ship goods, river-boat goods, glass for lanterns, clocks, and mirrors—all these things were demanded in vast quantities by the new settlements that were springing up everywhere throughout the West and part of the Northwest.

Bryce understood this situation and realized the opportunity it offered. He organized a coöperative company, every member of which was a practical glassman, and erected a factory at Birmingham, on the Monongahela. This concern became one of the greatest producers of blown and pressed glass in America. By 1890, two brothers, four sons, and one grandson had operated the works. When it was established in 1850, from fifty to seventy-five hands were employed; in after years the number was increased to three hundred.

Bryce, McKee & Co. specialized in pearl and crystal table-lamps, bottles and perfumery ware, and pressed tableware. The metal was of excellent grade, clear and resonant; a great variety of forms and patterns were employed, including a large output of pressed-glass designs such as the "waffle," the "bell-flower," the

"acanthus," the "pineapple," the "star-and-feather," the "grape," "Westward-Ho," and many others.

Illustrations from the McKee Brothers catalogue for 1868 are reproduced in this volume through the courtesy of Mr. Harold Rugg of Hanover, New Hampshire, and Mr. Homer Eaton Keyes, editor of "Antiques." The cover states that McKee and Brothers are "flint glass manufacturers, corner Wood and First." Among the kinds of glassware listed and priced are carbon-oil lamps, candlesticks, lanterns for burning either oil or candles; sundries, such as glass toys, shoemakers' globes, butter-prints, soap-slabs, and hyacinth-glasses; apothecaries' shop furniture, including jars, funnels, mortars and pestles, and show-window globes, the latter being "cone or globe shape, pear shape, or French style," running from two to four sections in height, the large French type when engraved costing $18.00 wholesale. In many parts of America the fancy drug-store window-jar or urn has passed into oblivion, the apothecary shops of New York city retaining more of these manifestations of the sixties than any other town.

Many blue and purple hyacinth-bulb pots, blue-rimmed and blue-encircled clear-glass apothecary jars, "miniature pieces," etc., made by these Pittsburgh flint-glass men are erroneously called "Stiegel." Recently three dozen of the attractive cobalt-blue rimmed jars, with blue finial on the cover, were found in a mid-Western storage house. The owner, taking them East, disposing of them to various dealers and collectors, could scarcely convince her buyers that they were of Pittsburgh 1862 vintage and not a much earlier Eastern make.

The terms of sale in the McKee brochure are inter-

esting, in that they convey an idea of the business methods practised during America's great glass era: "Net cash, less [so much] per cent discount to be paid within ten days from date of invoice." The crockery and glass-dealers are "at the same time assured there is nothing elegant in Flint Glass Ware, made or furnished in this vicinity, but we make and supply." The "New York," "Boston," and "Cincinnati" patterns are advertised. The initials "R. L." are used in designating the bell-flower pattern, their meaning being a matter of conjecture. Mr. Keyes, in the April, 1927, issue of "Antiques," remarks:

> Collectors who have assiduously gathered items of glass in the well-known bellflower design, for table use, will be more or less pleased to learn that this pattern, too, is listed among the multifarious products of McKee and Brothers in 1868. But in the catalogue it is not identified by the pretty and now popular name of bellflower, but by the mysterious initials R. L., the meaning of which has thus far eluded discovery. The letters may, of course, stand for ribbed leaf.

In speaking of the "Dolphin" pattern, Mr. Keyes continues:

> There were more certainly other dolphins in other crystal seas than those owned and operated by the enterprising brothers from Pittsburgh. The McKee cetacean, it may be remarked, displays one peculiarity which differentiates it from others of the general school. In its extraordinary act of balancing, wherein it emulates Old Father William's feat of posing an eel on the end of his nose, it plants its chin firmly upon a circular base instead of upon a square (or an octagonal) one.

The price of the "Dolphin" candlesticks was $6.75 a dozen wholesale; while the little "pony dolphin"

card-receiver or bonbon-dish, which is found in clear glass, opalescent, and in various shades of blue, citron, yellow, and light green, retailed at fifty cents each in many of the small-town stores which handled a general line of glassware, crockery, and china.

In connection with the similarity of many other of the McKee patterns to those used by the Sandwich and other houses, Mr. Keyes writes:

> We may rest satisfied that many so-called Sandwich patterns, if produced in the Cape Cod establishment at all, were certainly not an exclusive specialty of Jarves and his associates. On the whole, it seems probable that, at various times, the same, or similar, patterns were turned out by a number of unrelated and widely scattered concerns, which either copied each other's successful designs, or else purchased their molds from mold-makers who impartially supplied all their clients with the same thing. The actual age of the patterns pictured may not fairly be judged by the fact of their publication in an 1868 catalogue. Some of these patterns were, no doubt, novelties which made their debut among the iron-clad engravings of Seymour. Others may have been in use for a generation or more—indeed from the beginning of the pressed glass period in the 1830's.

Several of these patterns are of decidedly earlier origin than 1860. The little butter-print's prototype was made in South Jersey as early as 1820; "Halley's Comet" was put up on the market by Jarves immediately after the heavenly apparition startled our forebears; the ribbed pitchers probably were first blown around 1815. This latter form of design, which by its prevalence may be called a Pittsburgh-Ohio type, is found in all kinds of metal, from coarse to very fine flint; in all weights, from very heavy to very light; usually in clear glass, but occasionally in beautiful

amethyst, citron, amber, puce, or cobalt. The crimped handle, frequently the crimped foot, and a wide roomy spout are characteristics of this pitcher.

The fine flint blue and white and (rarely) rich purple, hollow-stoppered, swirled vinegar-cruets were also blown at these Pittsburgh houses. They are generally accredited entirely to Stiegel.

The "Fillmore salt" is appropriate in name. Every American President and Vice-President and every leading orator was in some manner memorialized upon our glass. Nearly every occupant of the White House used a "salt" named for him.

CHAPTER XL

JAMES B. LYON OF PITTSBURGH

James B. Lyon, of Scotch-Irish stock, was the son of John Lyon of Juniata County, Pennsylvania, one of America's developers of the iron-industry. James was born April 21, 1821, at Pennsylvania Furnace, Center County. After an academic education, the boy entered the offices of Lyon, Shorb & Co. at Pittsburgh, his father having moved to that city in 1834. In 1847 he entered the banking business at Hollidaysburgh. January 1, 1849, he organized a flint-glass company, and began the erection of a little furnace on property that later became the corner of Thirteenth and Railroad streets, Pittsburgh. In March of the same year the partly completed buildings were burned to the ground. Although greatly disheartened, Lyon rebuilt the works, and in the spring of 1851 bought out the interest of his partner—a man named Wallace.

Lyon then reorganized the company, taking in William B. David and Alexander P. Lyon, and incorporating as James B. Lyon & Co. In 1852 this company purchased the old O'Hara glass-works property. It consisted at this time of a ten-pot furnace, which Lyon increased to three furnaces of equal size. In a few years all the old buildings were torn down, and two of the largest and finest furnaces ever built in America up to that day were erected. In the old type, which were large for their kind, the pots were filled and melted only once a week, with a batch of 1500

pounds. In the new furnaces, a batch of 3500 pounds could be melted three times a week, each new furnace having seven times the capacity of each of the old ones.

In 1849, Pittsburgh had five flint-glass houses which were turning out good blown and pressed glass, the output of pressed glass steadily increasing month by month. In 1838 the general use of pressed glass as a commodity was just beginning; by 1850 it had taken a secure hold upon the American people; by 1859 it is doubtful if one out of a hundred homes was without it. Lyon developed beautiful models for his pressed wares.

In our consideration of American glass, it is important to note that the house of Lyon, and not the Sandwich factory, was the first in the United States to adopt pressed glass as its main line of production. The standing of James B. Lyon in the trade was always equal to, if not higher than, that of Deming Jarves. Jarves himself considered Lyon and his glass the exemplification of all that was best in the industry.

At a meeting of the National Flint Glass Manufacturers Association at Philadelphia in 1866, a resolution was passed requesting James B. Lyon to represent the pressed-glass industry of the United States at the Paris Exposition of 1867. The compliment gratified him, and the firm sent a full exhibit of fine and delicate pressed ware, which was awarded both a diploma and a bronze medal for "superiority in pressed glassware." Medals were also awarded to Lyon & Co. above the other American competitors at the Pennsylvania Institute Fair, the Maryland Institute, and the Centennial Exposition. The house held foremost rank until 1886.

Lyon "originated" as many pleasing designs, popularized as many, and produced as great a quantity of ware as did the Sandwich factory. Barytes earth was used in his operations, and there is as much silvery sheen to Lyon glass as there is to the Cape Cod productions. Jarves strove to imitate Lyon, and to equal his splendid metal; he did a good job of it, but Lyon led the way. He made virtually everything in the way of pressed glass which is commonly called "Sandwich," with the exception of the Gothic patterns and some of the beautiful blown and pressed lamps and candlesticks which Sandwich made in such marvelous variety. Jarves's lamps and candlesticks are, all in all, the loveliest ever made in America.

The Lyon firm employed gilders, engravers, etchers, cutters; it used a large range of colors in its molded glass; its die-cutters, pattern-designers, and mold-makers were artisans trained in their profession; workmen of experience were imported from England, Ireland, France, Bavaria, and Germany. A contemporary wrote: "To such a degree of delicacy and fineness have they carried their manufacture, that only experts in the trade can distinguish between their straw-stem wines, and other light and beautiful articles made in molds, and those blown by the most skilful workmen."

Lyon was given credit by the American Flint Glass Association for overcoming difficulties well understood by practical glass-makers; also for "doing away with the prejudice of the skilled blowers, who rebelled at the idea of employing mechanical processes in the manufacturing of glass." While this very elimination of prejudice robbed our glass of its individuality, of its fullest and truest beauty, causing havoc from the present-day standpoint of true artistry, we

must acknowledge that it required a dominant personality to have convinced our artisans that the mechanical process was superior to the hand-blown.

When James Lyon first decided to become a glass-manufacturer, he was the veriest novice. "I did not even know what glass was made of," he tells us. The fact that he was not bound by antiquated methods, prejudices, or formulæ, caused him to enter the field with fresh and somewhat novel ideas. He possessed three attributes to a marked degree—forcefulness of will, energy, and devotion. Trade jealousies, which more than once were paramount in our glass-production of the 1827 to 1864 era, never touched him; every discovery or finding which he made, every coloring or composition which he evolved or improved upon, was given to his competitors for the good of the trade. He studied systematically and scientifically the chemistry of the glass-business, which had been retarded for twenty years by lack of proper appliances. Pressed glass became his great hobby. The more he experimented with it, the more encouraged he became; and a lacy loveliness of pattern was one of the results.

Under Lyon's ownership of the O'Hara works, natural gas was first used for fuel, his watchful eye finding that the life of a clay pot averaged only four months under coal fire and six months under natural gas. His pot-clays were an admixture of imported and native earths, with a large proportion of old pots, picked clean, in the mixture. Previous to 1864 the materials used in the making of his flint-glass were sand, pearlash, red lead or litharge, nitrate of soda, and barytes earth.

Lyon specialized in large and complete table-services, also in delicate small articles such as fine

pressed salts and articles for toilet use. His light-blue "Irish Harp" toddy-plates, his "Eagle" salts, his shield, scroll, and volute combinations, his feather, flower, and star patterns, his geometrical backgrounds, stand at the top of our early pressed ware.

Shall we not accord this cultured, courteous, likable man the place in his profession accorded him by his contemporaries? Shall we not accept the statement of that astute genius, Deming Jarves, that James B. Lyon made the finest pressed flint-glass in America?

CHAPTER XLI

OTHER PITTSBURGH HOUSES

The Denny & Beelen glass-house is said to have been the first industry of its kind to be built upon the north banks of the Ohio River. Both the proprietors were interested in a number of early undertakings in and about the town of Pittsburgh, and in 1800 they purchased "Out-lot No. 15" of the Reserve Tract opposite the head of Alliquippa's Island, for the purpose of erecting a furnace. We are told that the furnace held eight pots, and that the production consisted of bottles. It is doubtful if any authenticated specimens of the latter exist. Within a year or two the fires were drawn, owing to a shortage of fuel, all the coal-banks being on the other side of the river (so the early historians assert). The following, from the young Quaker Richard Scull's "Gazette," indicates that the house was not running in November, 1801, although an early record gives 1802 as the time of its abandonment:

The subscribers having closed their partnership, are desirous to have all their accounts settled—they call ONCE MORE upon those indebted to them to make payment.

DENNY & BEELEN

Pittsburgh, November 4, 1801

N. B. The business [they had a store in Pittsburgh] is continued and a fresh supply of GOODS just opened by

EBENEZER DENNY.

Soal Leather
Fresh Juniper berries
Beef, Pork, Whiskey, Salt, Soap, & Candles
are wanted

Other Pittsburgh Houses

The Birmingham district of Pittsburgh became the seat of the fourth glass-house to be established west of the Alleghanies when, in 1810, Christian Ihmsen built a small bottle and vial furnace there. This was probably the same works in which Sutton & Wendt were interested. The various members of the Ihmsen family became associated with so many glass-making endeavors that it is next to impossible accurately to chronicle their undertakings.

The Ihmsen works at Birmingham was a vial and green or black glass bottle factory. Many changes took place in its personnel and in the variety of goods blown. The Birmingham owners did a large portion of their own blowing, and by 1825 were shipping hollow-ware to all parts of the Union. In this year, trade had increased to such an extent that forty hands were employed; ten thousand pieces of hollow-ware were blown, and one hundred gross of porter-bottles made.

In 1826, W. Ihmsen started a glass-house at Williamsport on the Monongahela. This was known as the Williamsport Glass Works, the recorded output being three thousand boxes annually of various kinds of glass. A considerable amount of blown hollow-ware also came from the Monongahela River district. For a number of years it was thought that the name "W. Ihmsens," which appears on certain bottles, was "Wehmsens," but such is not the case.[1]

In 1836, Whitehead, Ihmsen, and Phillips, three of

[1] Three other marks which have led to confusion in designating and attributing certain flasks are "I. P.", intended for "J. P." (Justus Perry); "P. & A." instead of "F. & A." (Fahnstock & Albree); and "A. L. D. H. C." instead of "A. & D. H. C." (A. & D. H. Chambers). These, and such markings as the word "Keene" without the completed "E's," or "Keen" without the final "E" on the Keene flasks, are due to the stamp or mold becoming indistinct or having been carelessly cut.

Pittsburgh's practical glassmen, controlled four industries. One of these was the Birmingham, closely associated with the early Ihmsen works on the Monongahela, a flint-glass house which did an immense business. In 1836 the output was valued at from $100,000 to $120,000. Almost nothing has appeared in print concerning this very large establishment—a glass-works which was turning out as much flint-goods as any house in the United States. What did it make? We ought to know as much about its 1836 production as we do concerning that of Sandwich, the New England Glass Co., or Bakewell's.

This enterprising firm also ran a black-bottle factory which manufactured containers for champagne, claret, wine, porter, and apollinaris and blew demijohns and carboys. The vial-works turned out 112,600 gross of medicine-bottles yearly. There was also a window-glass works. William Ihmsen and F. McGowin became associated with the firm around this period.

C. Ihmsen and Frederick Wendt took out a patent on a superior kind of window-glass in 1838. Made by a new process which they had worked out, it was said to excel the old crown window-glass.

In August, 1846, the "Pittsburgh Daily Gazette and Advertiser" carried the following advertisement:

Wm. Young C. Ihmsen F. Plunkett

YOUNG, IHMSEN & PLUNKETT

Flint Glass Manufacturers

Warehouse Nos. 53 Water & 104 First St. Pittsburgh bet. Wood and Smithfield.

Warranted equal to any in the country

Will sell Green Porter Bottle[s]

Pint Flasks

made by the Jefferson Glass Factory

John Robinson, an English glass-worker, came to Pittsburgh, probably direct from the Stourbridge glass-works in England, and in 1823 built a factory for the making of flint-glass, near the corner of Ross and Second streets. It was the fifth industry of its kind in the town. Under Robinson's watchful eye and good management, the business grew rapidly, competing with Bakewell's in many lines of the trade. In 1825, eighteen glass-blowers, decorators, and engravers were on the pay-roll, the "blanks" being made at the factory and cut, etched, or engraved at another building on the corner of Ross and First streets—just a block away. Decanters, wine-glasses, tumblers, and sweetmeat-jars, after the English-Irish manner, were the chief output, the value of production in 1825 being $22,000.

Sometime between 1825 and 1836 the firm-name became Robinson, Anderson & Co. By this latter year, $90,000 worth of goods were being produced. In 1837 Pittsburgh and its vicinity boasted of eight cutting-establishments, wherein lovely bottles and glasses of all sorts were made. The pressing-machine was added to the equipment of Stourbridge, and from 1836 or 1837 until the closing of the plant the output was considerable.

The "Pittsburgh Gazette" of October 6, 1834, contained the following announcement:

TO MERCHANTS GENERALLY

New Stourbridge Flint Glass Works

The subscribers respectfully inform the public that they are now manufacturing FLINT GLASSWARE in all its variety and are prepared to fill all orders with despatch. They invite dealers to give them a trial and examine their

assortment. They are disposed to sell low, and on accommodating terms.

T. & J. Robinson.

John Robinson died in 1836. At least two marked pieces of Robinson's pressed glass have come to light—a clear-glass tea-plate bearing the imprint of "John Robinson, Stourbridge Glass Works, Pittsburgh," and a boat salt.

One of the first flint-glass houses built in the United States after Deming Jarves introduced red lead into the composition of flint-glass on this side of the Atlantic, was established at Pittsburgh in 1827 by Robert B. Curling and William Price. Within a few months the two men dissolved partnership, Curling taking his two sons, William and Alfred, into the business with him, and adopting the firm-name of R. B. Curling and Sons. They were turning out large quantities of "cut, plain and flint glass" even in the earlier years of their operation. The Fort Pitt Glass Company, the trade-name used by the house, was composed of the three Curlings and Henry Higbee in 1834. Dissolving by mutual consent in the forties, the older men withdrew from the organization, leaving William and A. B. Curling to carry on the business. The Curling brothers enlarged the plant, increased production, and carried on an extensive trade in blown, molded, and pressed flint-glass.

Sometime in the fifties, Morgan Robertson, Edward Dithridge, and Henry L. Ringwald were admitted to the firm; and in 1857, Dithridge assumed complete ownership, operating successfully until 1873. The house was located at No. 17 Wood Street,

and the furnaces were fired for fifty-four consecutive years, the total output of the firm probably being about one half as great as that of the New England, the Sandwich, or the Bakewell companies. The Fort Pitt concern turned out a large number of cup-plates, being responsible for the "Fort Pitt Eagle," and probably also the very rare circular "Fulton" with bull's-eye rim; and it was at least one of the manufacturers of the "Plow," in clear glass and blue colorings, the "Anchor," the large "Harp with Star," the "Lyre," the "Thistle" and the "Eagle" with bull's-eye rim.

In 1831, Henry Campbell and Captain John Hay built a small flint-glass furnace on the Monongahela River, the house being known until 1834 as Hay & Campbell. Campbell bought Hay's shares in 1834 and took John E. Parke and James Hanna into the business. Parke, Campbell & Hanna operated until 1838, when the firm dissolved, Campbell entering the river steamboat business. In 1837 forty hands were employed, the output being valued at $50,000.

Mulvaney & Co. established a flint-glass works on the Monongahela in 1836, the founders being Patrick Mulvaney, William O'Leary, and James Robinson. In 1847 the copartners were P. Mulvaney and James E. Ledlie, the latter owning stock in various works at different times. The firm at this period was known as Mulvaney & Ledlie, although the trade-name had always been the Birmingham Flint Co. A good grade of lead-flint glass was produced, "blanks" for glass-cutting, blown glass, and pressed glass constituting the output. An advertisement in 1847 informs the public that it can get "Cut Molded and Plain Flint Glass-

ware in all its varieties at warehouse cor. Market and Water Sts."

Alexander Chambers, a Scotch-Irishman who became one of the best-known "bottle-men" in the United States, was born in 1819 and brought by his parents to Pittsburgh when an infant. Poor, and with no particular education, he started out (as did so many of the Scotch-Irish of Pennsylvania and West Virginia) by entering one of the district's glass-houses as an apprentice. He quickly mastered the various branches of the work, and at the age of twenty-four years was ready to embark in the business, taking in his brother David as a partner. Their first factory was small, the output consisting of green and black vials and bottles; but after ten years of accumulative means and trade, they bought property on the South Side, and in 1853 moved into new works erected there. From this year on they made window-glass and a better grade of bottle-glass, at the same time continuing their line of dark bottles and vials. Upon opening the new building, they engaged fifty men, but the trade expanded so rapidly that before many years five hundred persons were on the pay-roll. In 1862 David H. Chambers died, and Alexander continued the business alone until he died (March 28, 1875), when the factory was taken over by his son James and H. B. Patton.

Alexander Chambers was one of the first—possibly *the* first—manufacturer in America to increase the size of window-glass from the prevailing small pane.

The concern used the trade-name of the Pittsburgh Glass Co., but is known to collectors by its firm-name of A. & D. H. Chambers, or the initials "A. & D. H.

C.," which we find impressed on an occasional flask.

The brothers made several trips to Europe, studying foreign trade conditions; and as they installed the latest improvements in their five large furnaces, an enormous amount of cylinder-glass, bottles, flasks, phials, and apothecary's supplies was blown. The factory, on the banks of the Allegheny, had every facility for convenient shippings.

It is probable that A. & D. H. Chambers made every general type of historical and pictorial bottle blown in the Pittsburgh district, their best-known marked flask being the "Union and Clasped Hands" model, similar to the marked E. Wormser, W. Frank & Son, and Lorenz & Wightman "Unions." The stamp on the Chambers flask is generally found on the ribband floating from the beak of the eagle, whereas in the other bottles the name or initials are more frequently found on the obverse panel or on the bottom of the bottle.

These "Unions" were made during Civil War times, and gained great popularity. The best-known Chambers type is as follows: Obverse: Clasped hands in upper panel of large shield, lower portion of shield containing seven bars and small panel containing words "Old Rye." Above shield, thirteen stars and word "Union"; olive-branches either side of shield. Reverse: Eagle in flight on shield, holding ribband in beak; panel on lower portion containing word "Pittsburgh."

The flask is generally collared, with snapped base. It is found in quart, pint, and half-pint sizes, and in the following colors: aquamarine, light amber, brownish amber, medium blue, light blue, blue-green, yellow-green, citron, and deep rich green.

Wilson Cunningham (born in 1812), a practical glass-manufacturer, and George Whitten Jackson erected a bottle and window-glass factory on Water Street, Pittsburgh, in 1845. From that year until 1852 Cunningham and Jackson also carried on a foundry, and dealt in iron, steel, grain, and glass. The glass-works did not get well under way until 1850, at which time cylinder-glass, black bottle-glass, flint-glass, and druggists' glass were advertised. After 1852 the firm was composed of Wilson Cunningham, his brother Robert, and George Duncan. In 1865 the house was known as Cunningham & Ihmsen. Later, the interests of Dominick Ihmsen were sold, and the firm became Cunningham & Co., being composed of Wilson, Robert, and Dominick O. Cunningham—the latter a son of Wilson. By 1880 the last-named was the sole owner. Dominick Cunningham, born in Allegheny County in 1834, was raised in the glass-industry, becoming one of the most expert glassmen in Pittsburgh. He was also the senior member of the large lumber firm of Schuette & Co.

The Cunninghams operated two extensive glass-works, one on Twenty-second Street, the other at Twenty-sixth and Jane streets, on the South Side. One factory was devoted to flint-glass making, producing pressed and blown tableware of all sorts in great volume. The other house made containers of all kinds, including bottles, flasks, jars, apothecary and chemical apparatus, and supplies of every variety in use in that day. One of these factories, probably the Twenty-sixth Street house, covered two city blocks and was then the largest building of its kind in the United States.

Various grades of metal were produced by the Cunninghams, from common green bottle-glass to an ex-

cellent grade of lead-flint. They turned out countless bottles for perfume, whisky-flasks, castor-oil, liniment, and medicine bottles of all kinds; pressed glass in all popular shapes and patterns of the time; blown decanters, wines, tumblers, cruets; and a large variety of salts, candlesticks, "nappies," and other desirable glassware which is loosely but erroneously termed "Sandwich."

The first Adams glass-furnace was started under many disadvantages, including an inadequate amount of capital. Untiring efforts and careful management on the part of Messrs. Adams and Macklin soon put the business on a sound financial basis. The factory was located on Williams Street, on the South Side of Pittsburgh, the offices being at the corner of Williams and Tenth streets. It is said that by "unremitting exertion they were able to give the public an excellent line of table glass."

Adams, Macklin & Co. were known to the public as "manufacturers of crystal glass-ware," the firm making both molded and mechanically pressed flint-glass. One of its specialties was the pressed-glass cup-plate, which was turned out in great numbers and in many patterns, including the "Henry Clay," the "log cabin," and many other of the designs which achieved popularity. It is likely that Adams made more of this article than any other flint-glass house in America.

In 1851 the personnel of the firm changed. John Adams became the senior partner; Godfried Miller, a German glass-blower, and four other experienced glassmen—A. A. Adams, W. Adams, James Dalzell, and George F. Easton—took stock in the concern,

which was henceforth known as Adams & Co. The business expanded, and in course of time occupied five large buildings, which stood upon two acres of ground. Two hundred men were employed in the fifties, exclusive of helpers and tenders.

The glass was of good grade, the output was prolific, the patterns were as diversified as those of any other works making pressed glass in the decade from 1850 to 1860, and the general range of colors used at similar works was employed. Candlesticks and compotes, lacy patterns of tableware, cup-plates, lamps, bureau-knobs, and many other articles were produced.

John Adams was a director of the Iron and Glass Dollar Savings Bank of Pittsburgh, and a power in the Flint Glass Association of America.

The output of Adams glassware was shipped throughout the West, being among the earliest pressed glass going to Sacramento, San Francisco, and the settlements along the Pacific. Large consignments were sent to Cuba and South America, but the heaviest shipments were to towns and cities of the rapidly growing Mississippi Valley.

E. Wormser & Co. established the Pittsburgh Green Glass Company in 1854, at 22 Market Street. Sometime after 1864 the firm-name was changed to the E. Wormser Glass Co., Ltd. The industry confined itself to bottle-making. With no reservations or exceptions, the finest metaled and molded flasks I have ever seen are two quart whisky-bottles marked "E. Wormser & Co., Pittsburgh, Pa." The pattern on each is the rather common "Obverse, Union and clasped Hands; reverse, Eagle in flight above panel." But the metal is almost

as thin as insufflated glass, the design stands out in bold relief, the glass seems to shimmer in both natural and artificial light,—one is citron the other is ultramarine-blue.

It stands to reason that E. Wormser & Co. employed a good metal-mixer and an excellent mold-chipper, and used the best grade of materials for at least a portion of their production. They probably made many grades and varieties of containers.

The South Side of Pittsburgh became the site of an extensive glass-works in 1859 when the Pittsburgh Glass Manufacturing Company constructed a flint-glass factory there for making blown and pressed tableware and lamps. Within the following few years the firm was successively known as Atterbury, Challoner & Hogan, and Challoner & Taylor. After the adoption of oil for illuminating purposes, the plant was taken over by the Mackbeth-Evans organization, whose oil-lamps became famous the world over. The house was involved in the big glass-workers' strike of 1878 and 1879, when the operatives rebelled against the use of the crimping-machine.

The furnace of Challoner & Taylor held the record for mass tonnage in America, being the *largest* ever constructed. Its builder, Philip Arbogast, had also erected two nearly as large at the Sandwich factory; they were of the type known as the "deep-eye," the dimensions being such that the capacity for combustion and melting was the most economical, from a fuel standpoint, in America. The Arbogast furnaces were also famous for the purity of the metal from their pots.

The factory was locally known as "The Bush," and is but another of our finest and largest industries with

which the antique dealer, collector, and writer have been too long unfamiliar.

Agnew & Company, flint-glass and bottle makers, were located on the southern bank of the Monongahela, with offices at 153 First Avenue, Pittsburgh. The factory grounds covered one third of an acre, the main building being forty by sixty feet in size. The furnaces each contained six large double-mouthed pots; blasting lasted ten months of the year; and fifty-five hands found regular employment. The firm did a large business, records stating that "every variety of flint glass was made, staple varieties of bottles, and fancy ones of all kinds and sizes made to order."

In 1879, John Agnew was the oldest practical glassman then living in Pittsburgh who was actively supervising a business. When a youth, he was apprenticed to William McCully, and was intimately connected with the glass-industry all of his life. His trade extended from coast to coast, and from Canada to Mexico, regular shipments going to Maryland, Arizona, California, and Ontario. The Agnew clear-white and golden-amber perfume, bitters, patent-medicine, and similar bottles were of exceptionally good metal and design. Among the well-known patent-medicine containers of this make are the "Indian Queen" and "Ear of Corn," each three quarters of a quart in capacity and golden amber in color. They are very similar to those made at the Whitney works.

William S. King founded the crystal-glassware firm of Johnson, King & Co., in 1864, the house being located on Eighteenth Street, in the South Side district of Pittsburgh. It operated two factories, each contain-

ing two furnaces, the annual output being estimated at a value of $125,000. The firm specialized in bar goods, apothecary and confectionary jars (including blue-ringed jars with a blue finial or knob on the cover), candy-jars with a special gum-ring and glass-covered top, and fancy preserve and jelly glasses.

Although Repley & Co. did not build their glass-house on Tenth Street until 1866, we mention the industry because it merged into that of George Duncan & Sons in 1874. The latter organization soon included a son-in-law, A. H. Heisey, father of Clarence and Wilson Heisey, present-day glass-manufacturers of Newark, Ohio. Duncan & Heisey, in the Pittsburgh days, made "complete sets; elaborated lamps; lights of all kinds; engraved, cut, etched, stained, pressed, and colored tableware." Their pressed glass "rivalled the appearance of the finest cut glass"; and they paid "particular attention to specialties, including bar goods." The ware was "finished and polished to a wonderful degree of excellence."

It may be of interest to note that one of the salesmen for the Boston and Sandwich company later acted in a like capacity for Duncan & Heisey, and that Clarence Heisey and Wilson Heisey of Newark, Ohio, now own a considerable collection of the old Sandwich mahogany mold-models, which were given to their father by this agent. These are believed to be the only models ever salvaged from Sandwich.

Among the cylinder-glass and bottle houses built along the Monongahela and Allegheny rivers were Wolfe, Hard & Co., established 1836; Phillips & Best, established 1840; Lewis and Samuel Harcum,

who operated the Hope Glass Works for several years beginning in 1850, and made mineral, hock, and wine bottles; Simpson, Lake & Stanger, who built a works in 1848, specialized in colored glasses for lanterns and river-boat equipment, and were among the first houses in the country to manufacture amber-colored patent-medicine bottles.

Bobo & Albeitz operated the Eagle Glass Co. in 1852, producing vials, medicine-bottles, and flasks; they are said to have made variations of the "Eagle, reverse Eagle," the "Union and Clasped Hands, reverse Eagle," and the "Pike's Peak" whisky-containers. Around 1850, Ledlie & Ulam were making bottle-glass, continuing until the death of George Ledlie in 1858, when Charles T. Ihmsen took over his interest, the firm becoming Ihmsen & Ulam; at a later period the house was known as Blackburn & Ulam. Arbogast & Kaplahn are listed in the 1860 glass-directory.

CHAPTER XLII

THE THIRD NEW JERSEY GROUP

In 1827, Thomas H. Richards constructed a cylinder-glass furnace in the heart of the Waterford forest, calling his factory the Jackson Works, in honor of Andrew Jackson. Richards gradually built up a large trade, and personally supervised the industry for nearly half a century. After his death his two sons, Samuel and Thomas junior, took over the reins, and operated the house successfully until the surrounding timber was exhausted. In 1877 the buildings were partially destroyed by fire.

The following item from the "American Banner" of April 30, 1853, would indicate that window-glass was not the only output of this house: "*Jersey Glass*—We were shown a beautiful specimen of blue glass, a few evenings since, made at Jackson Works, by *Americans*. Our informant states that our own countrymen have proved more successful in this department of labor than the best *imported* hands." More of our prized Jersey glass may be "Jackson" than "Wistar."

Daniel Miller and Lewis and Jacob Stanger built a bottle-factory at Lewisville, New Jersey, in 1834. They operated it until 1841, when the Whitney brothers purchased it from the Stanger family. The name "Temperanceville" was given to the community which grew up about the works, from the fact that the Stangers were prohibitionists, refusing to employ any

but temperate workmen around the place. Considering that about half of the conflagrations which destroyed our early glass-houses were caused by drunken employees accidently setting fire to the factories, it is no wonder that an occasional owner enforced non-smoking and non-drinking laws within the confines of his works. This furnace was locally known as the Temperanceville Glass Works, although the firm-name during the Stanger control had been Lewis Stanger & Son, the company in reality being composed of Lewis Stanger, his son George C. Stanger, and his brother Jacob Stanger.

The Stangers made an assignment the year they disposed of the property. It is regrettable that this large family of efficient craftsmen should have so frequently failed in their many attempts to manage glass-houses. We draw the conclusion that whereas their ability as glass-blowers was unquestioned, they lacked the managerial or executive ability necessary in the work. In 1842, Woodward Warrick took over active management of the works for the Whitney brothers, Warrick having married a sister of the Whitneys. Thomas H. Whitney and Benjamin Harding had acted as the assignors.

Under the régime of Eben Whitney and Woodward Warrick, from 1842 to 1849, no window-glass was made at Temperanceville, the Stanger production having consisted of window-glass and a small amount of hollow-ware. Hollow-ware, including a preponderance of bottles and flasks, was the output of the Whitney-Warrick management. In 1849, Warrick sold his interests to Eben Whitney, who supervised the glass-making until either 1855 or 1859; the accounts regarding the dates differ. During one or the other of these years,

Thomas W. Stanger and Woodward Warrick bought the property, increasing its facilities and converting it from a bottle-house to a cylinder-glass house in 1864. It was operated by Stanger and Warrick until the death of the former in 1883, at which time J. Price Warrick, T. D. Warrick, and H. S. Warrick formed a new company.

George Dummer, William G. Bull, and Joseph K. Milnor established the Jersey City Glass Company in Jersey City, in 1824. A lead-flint industry, this works turned out a large output of cut, etched, and engraved glass, including wines and decanters, tumblers, carafes, pitchers, fruit-dishes with and without standards, and various popular wares of the period. The company had an excellent trade and reputation. George Dummer was the manager of the works for a number of years, until he was succeeded by Reed and Moulds. Industrial conditions of the country during the early sixties, which almost ruined every glass-house of a similar character in the United States, caused the abandonment of this manufactory. During the Civil War its buildings were converted into a sugar-refinery. One of the marked salts was made by the Jersey City Glass Company.

In 1861, H. O'Neil began the making of flint-glass in Jersey City, calling his furnaces the Jersey City Flint Glass Works. Apparently the factory turned out a little of everything found on the glass-market of this decade; one of the firm's advertisements listed "pressed-ware, cut flint glass, colored glass ware, druggists supplies, fish globes, bar room accessories, lamps and chimneys." This Jersey City factory manufactured a large number of clear-glass and colored-glass urns, with

domed tops and pointed finials, which were used by nearly all of the apothecary shops in the United States as window signs or ornaments. The clear-glass varieties were usually filled with colored water and at night were illumined by a gas-jet which was placed in the window behind the body or bowl of the urn.

In 1848, Samuel Norcross, Lester Gager, Matthias Simmerman, William Peacock, Joseph Heritage, Benjamin Y. Thackara, and other stockholders built a hollow-ware and bottle house in Tansboro, Norcross and Heritage assuming the actual management of the plant. It failed to pay, and the fires were temporarily drawn, but Samuel and Ulrich Norcross re-opened the establishment a year or two later. In 1856, J. L. Mason of New York, who had been granted a patent on an improvement of the glass fruit-jar, took over the concern, beginning to manufacture the jar which eventually made him famous. Success was not immediate, and in 1862 he employed Joel Bodine and Charles Adams to oversee production. The Mason jar soon became a nationally known commodity, and the Bodine family operated the ever growing industry until 1885.

The smallest glass-house in the United States, a little concern having but one furnace of five small pots in capacity, was built by Samuel Crowley at Bulltown (now Waldo), on Bull Creek, in 1858. It was primarily a bottle-glass works, although a small amount of "offhand" ware was blown, as was the case in all of the other New Jersey houses.

John P. Buck and Nathaniel L. Stratton built a glass-furnace in Bridgeton (Bridgetown), Cumberland

County, in 1836 or 1837. Until 1841 the firm-name of this house was Stratton, Buck & Co. John Buck died in 1841, and the buildings were burned the same year. The factory was rebuilt by John G. Rosenbaum, who operated it for five years, at the end of which time Joel Bodine, the well-known glass-manufacturer, and his three sons—John F., Joel A., and William H.—took it over, the trade-name of the industry becoming Joel Bodine & Sons. The Bodine family managed the business from 1846 to 1855, when they sold the property to William Maul, Joseph Borden, and a man named Hebrew, the firm being known at this period as Maul, Hebrew & Co. Evidently the undertaking failed at once, for the works were offered at public sale by the sheriff the same year and were bid in by Colonel David Potter of Bridgeton and Francis J. Bodine of Philadelphia, who operated the place until 1863, when Potter disposed of the shares to Francis I. Bodine and J. Nixon Bodine, sons of Samuel Bodine, whereupon Potter & Bodine became J. & F. Bodine. The Bodine brothers managed the glass-house until 1867, while the last to operate the factory was the Cohansey Glass Mfg. Co., incorporated in 1870. The firm made window-glass, bottle-glass, and a small amount of flint-glass.

A little glass-works not much larger than the Bulltown bottle-house was erected a few miles distant from it, at Crowleytown. It operated between 1851 and 1866, and was situated on the Mullica River, about two and a half miles below Batoto (Pleasant Mills). This eight-pot furnace employed twelve workmen, and in a few years the works was taken over by John Huffsey and a group of New Yorkers who operated

under the trade-name of the Atlantic Glass Works. Production included druggists' ware, chemical apparatus, and bottles of various sorts and sizes which were marketed through J. Huffsey & Co. of No. 50 Fourth Street, Philadelphia. Between 1858 and 1859 the Burling brothers operated the factory.

A bottle-glass and chemical-apparatus plant was erected in Salem, Salem County, in 1862, by John V. Craven, Henry D. Hall, and Joseph Pancoast. It was known as Craven & Brothers at a somewhat later period.

William Holtz also built a glass-house in Salem in the sixties, the firm merging into Holtz, Clark & Taylor within a few years' time. It was probably a bottle and window-glass house.

William Coffin and William Coffin, Jr., bought a wooded tract at Winslow, Camden County, in 1831, and built a glass-works there, adopting the firm-name of William Coffin, Jr., & Co. The father retired in 1833, a son-in-law named Pierce taking his place. Until about 1838 the company was known as Coffin & Pierce; then, following the death of Pierce, Coffin operated the house alone until Andrew K. Hay, another son-in-law, took over Pierce's share, Hay buying an interest in the Winslow works immediately after the neighboring Hammonton factory burned down. A practical glassman and a true artisan, Hay is accredited with many improvements in glass-manufacture, including a new way of using anthracite coal as fuel in the furnaces.

Coffin & Hay made excellent flasks between 1839 and 1847 to 1850. In the meantime, Tristram Bowdle

was admitted to the firm; and in 1847, William Coffin sold his interests to his brother, Edwin Winslow Coffin, and John B. Hay, the firm becoming Hay, Bowdle & Co. Bowdle withdrew in 1850, and Edwin Coffin sold his interest to Andrew K. Hay, who ran the factory with the help of his nephew John, until Andrew's death in 1881. The Hays made extensive improvements, turned the house into a window-glass works, and adopted the firm-name of Hay & Co. The heirs of Andrew Hay operated the plant until 1884.

Many of the flasks stamped "Hammonton" are thought to have been really made at Winslow. It is not known why none of the flasks were marked "Winslow."

In 1831, John Marshall and his son-in-law Frederick Stanger erected a good-sized bottle-works at Old Brooklyn, earlier known as Seven Causeways. The name of this house, the Brooklyn Glass Factory, has frequently led to its confusion with Brooklyn, Long Island, plants. Like most of the early glass-houses, Marshall's factory was built in an isolated spot, in the center of a large wooded tract. It is said that the Marshalls went to this remote section of New Jersey to avoid taking sides in the Revolutionary War, living in a log cabin near Egg Harbor River. Another member of the family started a glass-works at a place which he called Marshallville.

Frederick Stanger, a young man who had been brought up in the glass-industry, died before the first blasting at Old Brooklyn, and his father-in-law was left to carry on the business alone. Marshall's furnace held seven pots. Twenty blowers were employed, and from sixty to eighty men and boys worked in the packing-room and at preparing fuel for the furnace.

This last-named task required considerable time, from the first felling of the trees until the cord-wood was split into "shidders"—small sticks of wood of just the right size to maintain a white heat under the crucibles. At the close of a firing, the blowers used up the remains of the metal in the pots for their "fancy" ware, often mixing coloring matter with the liquid metal and then blowing and fashioning blue, amber, green, or brown candlesticks, pitchers, bowls, canes, or even little scent-bottles for their daughters or sweethearts.

John Marshall ran his bottle-works until 1839, turning out containers of various sorts, snuff-jars, and apothecary supplies. He cleared about $1000 annually, which in those days meant a satisfactory profit, and was considered a successful glass-maker. In 1855 the works burned to the ground.

The first glass-house in Williamstown (formerly Squankum) was erected in 1835 by a stock company composed of Richard H. Tice, Jacob Ewan, Isaac Dill, Samuel P. Tice, Matthias Simmerman, John T. Brown, John E. Ayers, and Joshua Eldridge. They bought a six-acre plot in the center of the town, at a cost of five dollars an acre, and called their project the Free Will Glass Manufactory. Operations started in the fall of 1835, and bottles from half-dram to two-gallon size were blown. The organizers then sold their interests to William Nicholson and dissolved the company, Nicholson assuming all obligations and paying $1425 cash for the works, at the same time giving bond for $4275. The same year he sold an interest in the concern to John Swope and Benjamin Smith. Woodward Warrick acquired an eighth-interest a short time later.

Nicholson retained the controlling shares, and the house operated successfully until the financial stringency of 1837 caused it to go into bankruptcy. The property was purchased by John Swope, Joseph Izard, Gabriel Izard, and John F. Bodine. In a year or two the firm was known as Bodine & Black, and by 1841 Bodine and William Coffin, Jr., were running the works, the firm being known as William Coffin, Jr., & Co. Next, Bodine ran the factory alone, until it closed in 1846 for a period of ten years. In 1856, Bodine again began its operation, in connection with his Washington Glass Works.

The house specialized in patent-medicine bottles and other druggists' wares, making numerous bottles for London Mustard, Turlington's Balsam, Godfrey's Cordial, Opodeldoc Bitters, and other preparations.

Joel Bodine erected the Washington Glass Works in 1839, directly across the road from the Free Will Works at Williamstown. Taking his three sons—Joel F., William H., and John—into the business with him, he founded the well-known firm of Joel Bodine & Sons. They continued in successful operation until 1864, when the Civil War disrupted the works. Walter R. Thomas purchased an interest in the plant; and under its later name of the Williamstown Glass Manufacturing Co., it was incorporated and ran until about ten years ago.

The Bodines manufactured "green and white glassware, pickle and preserve jars, druggists' vials and bottles, wine, porter and mineral water bottles," merchandising them from Thomas Bodine & Co.'s agency at 807 Market St., Philadelphia.

The following advertisement appeared in 1850:

JOEL F. BODINE JOHN BODINE WM. H. BODINE
JOEL BODINE & SONS
Manufacturers
DRUGGISTS' GLASSWARE
Cologne and Perfumery Vials,
Porter, Mineral, Lemon Syrup Bottles, Jars, etc.
Williamstown, Camden County, N. J.
Office N. E. Cor. Market & Water Sts., Phila.
Particular attention paid to all kinds of private moulds.

The Milford and Medford glass-works in New Jersey are easily confused. There is a similarity in their names; both houses were situated in Burlington County; and they were contemporary.

After the Free Will factory at Williamstown failed, Matthias Simmerman went to Milford and built a furnace. The town, township, and county have passed through various changes in name. When the works was erected, the town was called Pendleton, and the industry was known as the Pendleton Glass Works. Ten years later it was probably owned by Lippincott, Wisham & Co., who operated it as a hollow-ware factory, in conjunction with J. Huffsey & Co. of Philadelphia. The plant was unsuccessful, and was sold at sheriff's sale on May 31, 1856, Joseph Izard bidding it in for $4900. The company which Izard formed to carry on operations met with no better success, and the factory was closed sometime prior to 1860.

It is known that the Milford people made, among other bottles, the "Jenny Lind" calabash for Huffsey. Few of their apothecary bottles have been identified. Their "offhand" blown ware undoubtedly adheres to the sectional tradition, and has added more than one treasure to our Jersey group.

The Medford glass-house was, strictly speaking, a farmers' coöperative venture. Nearly every male citizen in central and south New Jersey seems to have had the glass-manufacturing fever at one time or another—convenient sand-beds, waterways, pot-clays, and fuel tending to foster this obsession. The queer thing in connection with most of these ventures, many of which were undertaken less than a century ago, is that only the most fragmentary records exist in regard to their founding, duration, and production. It is sometimes even impossible to convince the present-day citizens of a town that their community ever contained a glass-house within its confines. Local historians have often entirely ignored these enterprises.

We read in connection with Medford that "in 1850 William Porter was operating a factory." In 1860 it was known as Cochran's Glass Factory, and from then on it was run successively by Clayton B. Tice, Joseph Ayres, and Louis Arland. It was a flint-glass works making "fancy table ware"—probably pressed. Later, a Mr. Heller turned it into a fruit-jar factory. In 1863, Yarnall and Samuels of Philadelphia bought it, and improved the furnaces and adjoining houses. But before they had finished these improvements they had sunk so much of their money that there was nothing left for operating expenses. From that year until 1923 the factory passed through many phases of ownership and operation, although hollow-ware continued to be the main output.

It is known that in the earlier days of operation the house made amethyst, purple, opal, emerald-green, and light and dark blue bottles; also colored vases and salts. It is quite possible that such pieces of Medford glass have been frequently attributed to both Stiegel

and Wistar. No more helpful work could be done in the field of American glass-collecting than an illuminating article on Medford glass, telling us what was made, and if possible when it was made. If such a task is ever accomplished, it will result in some surprises for the collector.

In 1836, Nathaniel Holmes, Christopher Ludlam, Richard Ludlam, Amos C. Moore, Samuel Mathews, Eleazer Crawford, and Morris Beasley organized the Dennisville Glass Manufacturing Company, whose plant was located a short distance from Cape May. It was a window-glass house; but, like the Estelville and other New Jersey houses, it has left us splendid occasional specimens of "offhand" blown glass.

William Coffin, Sr., built a small window-glass or bottle works at Greenbank, Burlington County, in 1840. Four years later the works was being managed by his son, John Hammond Coffin, who closed the house in 1850. It stood idle until 1857 or 1858, when (during the glass-makers' strike of that period) some of the Glassboro blowers rented the buildings and began making glass on the coöperative plan. They were not successful, and the plant was abandoned.

In 1869 the firm of Scott & Rapp manufactured flint-glass at another furnace close by the old Coffin plant in Greenbank. The furnace was constructed by a man named Bloomer, said to be an expert in glass-furnace building. Charles W. Wapler acted as superintendent of the factory, and it is probable that either this man or his father had supervised the Coffin house. While Scott & Rapp are too late for our consideration,

the house is recorded here on account of its unusual output. I find that my first glass collection undoubtedly contained some of these Burlington County examples, for the house made fine glass buttons, of the sort that little girls collected for their button-strings thirty-five years or so ago. This factory also made glass stars for Christmas-trees, glass fruit, and Christmas-tree lights.

The Excelsior Glass Works was built on Kaighn Avenue, Camden (probably Cain's Point), in 1841 by John and James Capewell and John Bamford. The last-named partner shortly withdrew from the firm, and the Capewell brothers carried on the works until the financial panic of 1857 brought about their failure. William Swindell, of Baltimore fame, was a glass-blower at this house. Frederick Capewell, father of the Capewell brothers, had been an expert glass-blower at Kensington during "Dr." Dyott's ascendancy; while Swindell's father and father-in-law had both been practical glassmen. The Excelsior works maintained sales offices at No. 11 Minor Street, Philadelphia.

The output, unlike that of the majority of glass-works in this State, consisted of flint-glass of excellent quality, which was made by nine expert blowers, also cutters and engravers and helpers.

Thomas Stanger, a cousin of Frederick Stanger, built a glass-house on the new Brooklyn-Williamstown Road, about a mile from the Marshall plant, in 1848. He had married his cousin's widow, Elizabeth Marshall Stanger, and he called his factory the Isabella Glass Works, after his young daughter Isabella. It has also been stated that Julius Stanger, a cousin

or a brother of Thomas, started the plant, and that Isabella was his daughter, the probable fact being that both of these men were instrumental in getting the house under way. Thomas Stanger had previously operated a glass-house at Port Elizabeth. He died in 1857, and the Isabella works was then run for ten years under the supervision of Clayton B. Tice.

This was a green-bottle works, its principal output being whisky-flasks in sizes from one-half pint to one quart. Authenticated "offhand" blown specimens from this works display reamed overlapping edges, crimped handles and feet and superimposed decoration about the body on the piece.

Fislerville or Fislertown (now known as Clayton), in Gloucester County, was the seat of a small glass-industry beginning in 1850, when Jacob P. Fisler, Jr., and Benjamin Beckett bought a wooded tract of seventy-five acres on the east side of the Glassboro and Malaga turnpike, and erected a furnace and adjoining buildings in a clearing in the woods. Workmen's houses were built, and the settlement was named for its founder. In 1851, Beckett withdrew from the concern, Edward Bacon buying his interests, and the firm became Fisler & Bacon. Bacon continued in the business until his death in 1856, after which Fisler ceased operations and rented the buildings to John M. Moore. Associated with Moore in 1859 were George C. Hewitt and Jeremiah D. Holgate, the firm-name being John M. Moore & Co. In 1863 Dr. D. Wilson Moore, a brother of John M. Moore, bought Hewitt's shares, and the firm became Moore Brothers & Co. In 1864, Holgate disposed of his shares to the Moores, and the concern was known as Moore Brothers until

1880, when three younger men—Charles Fisler, Harry Steelman, and Francis M. Pierce—were taken into the business.

The Fislerville works made hollow-ware, chiefly bottles, but unfortunately impressed no distinguishing marks upon its output with the exception of the "Jenny Lind" calabash model—a bottle made simultaneously by at least seven different glass-houses. The Fislerville "Jenny Lind" is of especial interest in that a view of the glass-works is stamped upon the reverse of the bottle, above which are the words "Fislerville Glass Works." The metal is generally a true aquamarine or light bluish-green. The sides of the bottle are ribbed, and the long neck is generally collared rather deeply about the mouth. This bottle is a trifle smaller than either the S. Huffsey or Ravenna Linds. Its main divergence from the other types, however, lies in the fact that the bust of the famous singer is *not* surrounded with a wreath, a smaller branch of laurel being stamped beneath the bust.

There were other window-glass houses in New Jersey between 1850 and 1865.

CHAPTER XLIII

STODDARD AND OTHER NEW HAMPSHIRE HOUSES

Gillman Scripture, John M. Whiton, and Calvin Curtis built a large bottle-works at Mill Village, near Stoddard, New Hampshire, in 1844, adopting the trade-name of the Granite Glass Works. After two years' operation, the factory burned to the ground; but it was rebuilt, and the company gradually worked up a large business in bottles, the annual sales averaging $25,000 for several years.

In 1856, Scripture, Whiton, and Curtis failed. Their distributing agent, George L. Curtis, in company with B. F. Messer, then took over the factory and ran it under the firm-name of Messer & Curtis, retaining the trade-name of the Granite Glass Works. In 1858 or 1859 Messer sold his interests in the concern to his partner.

In conjunction with the glass-works, the "Granite" owned two large packing-houses for its bottles, having manufactured containers for wholesale liquor and patent-medicine houses almost exclusively. In 1860, Curtis disposed of the warehouses to Weeks & Gilson. It is believed that the Granite Glass Works was destroyed by fire in 1864.

Joseph Foster, who had helped to establish several important glass-industries, went to Stoddard from Keene in 1842, buying property in the southern part of

the village and erecting a stone furnace for bottle-making. Not having a large amount of capital, he was unable to surmount the difficulties of extremely poor transportation facilities, the long-distance carting of his finished product consuming profits. Foster was obliged to close the plant. In 1850 he again attempted to operate it, but was soon compelled to make an assignment to Scripture, Whiton, and Curtis, who took the factory over and ran the furnace in conjunction with the Granite works.

The sons of Joseph Foster had been raised in the glass-business. At the close of the Civil War, in 1865, George, Charles, and Wallace Foster built a glass-house in the center of Mill Village, George managing the works while Charles and Wallace attended to the bottle-blowing. A younger brother, Joseph, was set to work making rattan and wicker casings for the larger containers.

The Foster sons adopted the trade-name of the New Granite Glass Works and ran the industry until about 1870, when the family sold out to Charles B. Barrett, a Boston wholesale liquor-dealer, who simultaneously controlled the Lyndeboro factory. The New Granite Glass Works burned to the ground, in 1871. This house made golden-amber bottles.

In 1840, Luman Weeks arrived in Stoddard from Peru, New York, and for ten years operated various stage-routes in this part of the country. In 1850 he formed a partnership with Almon Woods, Ebenezer A. Rice, Nichols Hilt, and F. A. Gilson, and started a bottle-works at South Stoddard. By 1853, Woods, Rice, and Hilt had withdrawn, Weeks and Gilson operating the business until about 1872. Bottle-mak-

ing, which had been the chief industry in and about Stoddard for a quarter of a century, abruptly ended at that time.

The plant of Weeks & Gilson did not burn down, as had the two Granite works, but a peculiar condition arising in the bottle-business compelled the firm to abandon operations in Stoddard. This was the introduction of clear glass, instead of amber and green, flasks, for the bottling of whisky, etc., the clear-glass bottles being produced at a price with which the manufacturers of colored-glass containers could not compete. And the silica about Stoddard precluded the possibilities of clear-glass making.

The South Stoddard Works (as it was usually called) made pint, quart, and occasionally half-pint flasks; also one and two quart and four and five gallon carboys. The principal output, however, consisted of bottles for the Saratoga Springs water. Ground bone and ashes were used in making the dark bottle-glass. It is said that some of the Stoddard glass-blowers made from $8.00 to $25.00 a day at their work, when under high pressure. Of course these houses did not operate twelve months of the year.

Both the bottle-collector and the "offhand" blown-glass collector are interested in Stoddard examples. Scripture, Whiton, and Curtis, as well as Weeks & Gilson, were fortunate in having excellent glass-blowers in their employ in the forties and fifties, among these being the Cutter brothers, the Foster brothers, the McClure brothers, Horatio Smith, and Mat Johnson. Horatio Smith later owned the Hancock Tavern on Faneuil Square, Boston, but went to California in the days of the gold-rush and died in Sacramento. Mat Johnson took a particular pride in

blowing specimens for visitors to the Stoddard works, presenting them with amber pitchers, vases, and bottles which to-day are the envy or the pride of the connoisseur. Johnson practised the South Jersey technique.

Besides flasks, medicine-bottles and mineral bottles, carboys and demijohns, the Stoddard houses also made ink-wells, a ten-sided golden-amber ink-well being particularly desirable. Few of these houses produced insufflated glass, although certain decanters, ink-wells, and hats were attributed to Stoddard until a year or two ago; it has since been ascertained that they were produced at Keene. No clear-glass fragments have ever been unearthed from the glass-house ruins at Stoddard, and no examples of clear glass have ever been authentically attributed to the town.

On account of poor sand, scarcity of proper fuel, and general high cost of production at Lowell, the Chelmsford glass-works was moved across the border from Massachusetts into the adjoining State of New Hampshire in 1839. Suncook Village was selected as a suitable location on account of its proximity to Massabesic Pond, whose sand was believed to be superior to that used at the old works. A thorough test of the silica could not have been made, for upon trial it proved almost as unsatisfactory as the other, too much iron in the sand making it unsuitable for production. The firm was compelled to resort to the expensive expedient of hauling sand from New Jersey, mixing the Maurice River silica with lime, sal-soda, and black and white salts.

The large pots of the Suncook Glass Works were heated from one furnace, each pot making about five hundred surface feet of glass a melt, the average

being twenty-five melts a month. This window-glass house operated nine months in the year, and under the management of William E. Hirsch and his German-born associates, Weber, Baruch, and Koch, the industry made a good grade of ware. Light-greenish bottles were occasionally blown from the fag-ends of the pots, and the workmen indulged in "offhand" specimens for the surrounding neighborhood or the occasional visitor to the factory. The fires were drawn in 1850.

Although the Lyndeboro Glass Company of South Lyndeboro was not formed until two years after the time-limit set for this volume, its production is so desirable from a collector's standpoint that we are including a brief mention of the works.

The firm was incorporated in 1866 by George H. Sanborn, John Hartshorn, Luther Roby, Timothy Putnam, and Charles F. Eaton. Fire-brick and other material than glass was also manufactured. Fifty men were employed at the various undertakings in one capacity or another, and success seemed assured to the owners. In June, 1868, the main buildings were completely destroyed by fire. They were soon rebuilt, but other misfortunes followed and the plant permanently closed in 1886.

South Lyndeboro made containers holding from one ounce to fourteen gallons (among the smallest and the largest bottles ever blown in America). At a later date plain amber bottles and dark-green pint and quart porter-bottles were blown, the latter being called "ash bottles" on account of their poor composition, the metal being largely composed of ashes. The early con-

tainers were of excellent quality and unusually good color. The bluish-aquamarine glass of South Lyndeboro is very like the bluish-green glass blown at Burlington, Vermont. Extremely interesting "offhand" examples of this glass are finding their way into our discriminating glass collections.

CHAPTER XLIV

ZANESVILLE, OHIO

Zanesville, one of the earliest settlements in Ohio, became the seat of the State's most important glass-industry (from the collector's standpoint) in 1815, when most of the surrounding territory was a wilderness. A group of progressive pioneers decided that a glass-house was necessary to the commercial upbuilding of the community, the constant flow of travel over the National Road, upon which the village was situated, affording additional trade for a concern making flasks and bottles. The McIntyre Inn, a large log structure, housed many a traveler famous in our annals; and Louis Philippe, King of France, also partook of "rest and refreshment" at this hospitable tavern.

The shareholders of the White Glass Works had left homes of culture in New England and Virginia, and the desire to surround themselves with the industrial arts manifested itself in the little towns such as Zanesville, Marietta, and Chillicothe. By an act of the Ohio Legislature they were granted glass-making privileges on May 13, 1815.

Isaac VanHorn, Samuel Herrick, Samuel Sullivan, Rees Cadwalader, Davis J. Marpole, Ebenezer Buckingham, and John Hanne put $50,000 into the venture, and a large glass-house was built upon what is now the southwest corner of Market and Third streets, the heart of Zanesville's present business district. Sam-

uel Sullivan, one of Ohio's first potters and probably her first maker of red glazed ware in this territory, was elected president of the company; John Hanne was the secretary; Edmund Jones was made superintendent; and Elija Ross was the maker of the blowpipes.

The original company operated under this management for five years, until 1820, when the plant was leased to Thomas Mark. Two years later Joseph Shepard (or Sheperd), a minister, James Crosby and Charles Bostwick purchased this industry, the new owners occasionally using Shepard & Company as a firm-name, although the factory was usually referred to as the White Glass Works. From 1822 to 1835 glass was produced in quantity under the efficient supervision of these three men. In the latter year Bostwick sold his interest to Shepard and Crosby, who were the joint owners until 1838, when the Rev. Mr. Shepard, the motivating force behind this now famous works, retired from the business of hollow-ware and flask making. Crosby was unable to manage the industry alone, and the furnace closed the following year.

Two years of inactivity followed. In 1842 six practical glass-makers came to Zanesville from other works, and, entering into negotiations with James Crosby, bought the property for $3000, or $500 a share. The new proprietors were George W. Kearns, Joseph Burns, W. F. Spence, Thomas Reynolds, George Wendt, and Samuel Turner. Improved methods were installed, from forty to forty-five hands were employed, and everything started auspiciously. But after two years Turner and Spence sold their shares to Arnold Lippet, and by 1848 all of the original proprietors had left the works. Lippet attempted to run the plant alone, simultaneously trying to manage the

old Murdock & Cassel works; but he failed in both endeavors, and the White Glass Works shut down in 1851.

This house made bottles and flasks and domestic hollow-ware for thirty-four years, unquestionably turning out much of the fine early glass which is now being found in Ohio, and evolving types and designs which differed from the blown flint-glass and flasks of other furnaces. With the exception of a few flasks, no marked piece of White Glass Works production has so far been found. It has now been proved that this house produced the mid-Western types of bowl, pitcher, cruet, and pan, in some respects similar to the production of the Greensboro (Pennsylvania) Glass Works; and that it frequently made expanded types from pattern-molds. Zanesville's output, like that of Keene, Cambridge, and Greensboro, has until very recently never been adequately appreciated. I am not stretching a point when I predict that these four houses will receive more attention within the coming few years than any other early glass-industries in America.

Of all the Zanesville productions, the marked "Zanesville, Ohio, Shepard & Co., Masonic, reverse Eagle, flask" and the long-necked, big-bellied swirled bottles now called "the Zanesville type," although they were made at other houses in the mid-Western district, are the best known. The Masonic flask is found in half-pint and pint sizes, its colors ranging through various shades of green, amber, and blue, and a very rare purple. The bulbous bottles come in pint, quart, and two-quart sizes (very often not true to exact measure), and are usually found in beautiful shades of amber and in green. They are also known in sky and ultramarine blue, puce, citron, yellow-green, bluish-green, putty,

claret, and some other almost unnamable shades. These bottles are frequently expanded until their bodies have attained the tensile quality of Stiegel's flint-glass. The Stiegel type of swirled bottle, less bulbous in form and with straighter sides, was also made by the White Glass Works. It is generally impossible to differentiate between these bottles and those made at many other factories. I have seen them in nearly every known color except rose, ruby, and purple.

The marked "Zanesville, Cornucopia, reverse Basket of Fruit" flask has been found in half-pint and pint sizes. When not stamped (they rarely were) it is impossible to distinguish these flasks from those made at many other glass-works, the model being, I believe, copied more often than any other bottle-design. Keene, Kensington, Lancaster, and a number of other houses made it.

The one-pint "Eagle, reverse Cornucopia, Agricultural" flask, marked "J. Shepard & Co. Zanesville, Ohio," is another model. It is almost identical with that marked "T.W.D." and made by "Dr." Dyott, and with the ones made at Keene. In fact, there is a great similarity in the technique and patterns of these three houses.

We are certain that one of the mid-Western types of the "Washington, reverse Eagle" flask was made at Zanesville, but we do not know which one.

The White Glass Works also employed the pattern-mold in making blown flint-glass tableware. Very few perfect specimens have survived, but I am satisfied that two double-domed sugar-bowls, a footed salt, and seven pitchers which I have examined are expanded from the pattern-molds of this house. They bear a kinship to the Pitkin and Keene swirled and fluted types. The

colorings of these pieces were either bluish green or amber. Very few specimens with ample authentication for Zanesville attribution have been found in the insufflated type, although two persons of my acquaintance assert that they have sufficient evidence to establish this claim. Several of the founders of the White Glass Works came from upper New England. It is logical to assume that they were familiar with the technique employed at Keene. It is also certain that the Pitkin-type flask was blown at Zanesville. These bottles, found in clear glass, light green, grass-green, amber, and reddish amber, were made by the "half-post" method, the bodies being dipped in the fluid glass for a second gathering; instead of being inserted, the neck was reinforced. The "Chestnut type" of hip-flask was also made in a variety of colorings.

Another early Zanesville house calls for mention here. In 1816, James Taylor and Alexander Culbertson built a window-glass and bottle works on a site opposite the place where the first canal locks were later constructed—a little south of Slagor Run. Under the name of the New Granite Glass Works, they operated the house successfully until 1823, when both of the men suddenly died. There were two or three James and John Taylors in the early mid-Western glass-industry—one at Brownsville, one said to have been at Wheeling, and James Taylor of Zanesville. It has not been definitely determined which one was responsible for the flask marked "J. T." The Taylor family were later connected with the glass-industry in Kentucky, and the name is also associated with a number of breweries in the Monongahela-Ohio River sections.

Thomas Murdock and Joseph Cassel [1] took over the property in 1823, and operated it successfully until sometime in the forties. Then Arnold Lippet acquired an interest in the firm, managing it in 1847 and 1848, during which latter year it failed.

Very little is known of the earlier bottles made by this house, but the later flasks marked "Murdock & Cassel" differ greatly in texture and weight from bottles blown at the White Glass Works. The New Granite Works was a window-glass house, its bottles being made from cylinder-glass. The White Glass Works was both a bottle-glass and a flint-glass house of considerable merit. I have never seen any other than light-green marked Murdock & Cassel bottles, while those authenticated as of the White Glass Works production are found in various and quite lovely colorings. To Murdock & Cassel the flask was a secondary consideration; to Joseph Shepard it was a primary one. A marked example is, however, a rare bottle.

In 1849, George W. Kearns, Joseph Burns, and John W. Carter built a bottle-glass factory on the Putnam side of the Muskingum River, directly across from Zanesville. Shortly after, the firm rented and later purchased the glass-house built in 1852 at the foot of Main Street by William C. Cassell and William Gallagher. In 1863 this building was converted into a warehouse, and a more modern plant erected. Upon the death of Joseph Burns, in 1864, his heirs withdrew their interests from the firm. At various times Noah Kearns, R. N. Dunlap, and Jacob Stimley owned stock in the company. George and Noah Kearns withdrew

[1] Joseph Cassel and William C. Cassell should not be confused. Each was a Zanesville glass-house owner.

from the firm after 1864, building their own plant on the southwest corner of Main and First streets, where they made window-glass exclusively. The production of the other houses consisted of both window-glass and hollow-ware. Glass hearth tiles in white, green and amethyst were made at this factory and many Eagle, reverse Eagle flasks.

John Carter, an experienced glassman, went to Putnam from Pennsylvania in 1852, and erected a small works on the Muskingum River, on the site of an early tannery. This house, known as the Putnam Flint Glass Works, later became Carter & Woodruff. After making many varieties of flint-glass, hollow-ware, and bottle-glass, the factory became the home of the Haines patent fruit-jar, in 1881.

Milk-pans with reamed edges, wide-necked and rather straight-sided pitchers, chemical apparatus, druggists' supplies, pickle and capers bottles, candlesticks, cruets, sugar-bowls, glass balls, hollow-glass dippers, glass globes, bottles, and many other commodities were blown at this works. The metal was of very good grade, and frequently so light a green as to be almost clear white.

CHAPTER XLV

OTHER OHIO HOUSES

Major Isaac Craig arrived in Cincinnati in 1813 or 1814, and built a glass-works near the Ohio River at the foot of Smith Street. Accounts vary regarding the date of completion of this works, and little is known of its subsequent operations.

In the year 1811 certain potash and pearlash makers were listed in the Cincinnati Directory. The same year John Mellish, writing of the town in his "Travels of America," remarked: "A well organized manufactory of glass bottles would succeed. Porter could be augmented, but it would first be necessary to have bottles, as the people here prefer malt liquors in the bottled state." Drake lists "stills, tea-kettles, green window-glass and hollow-ware" among the local manufactures in his 1814 directory. In 1815, Mansfield wrote that "a manufactory of green and window-glass and hollow-ware is about to go into operation in Cincinnati." Along about this time there is considerable mention of a forthcoming white-flint glass-works there, which was evidently proposed as early as 1813. Drake speaks of "one [glass-house] of white flint next summer with clean white sand from the mouth of the Scioto, and crucible clay from Delaware." We infer from this mention that the Scioto sand-beds, as a source of supply for the silicate used in glass-making, had already been discovered at that time. David Thomas, describing the town of Cincinnati in 1816, wrote: "Works for green

glass have lately gone into operation, but some articles produced are very imperfect."

A small glass-house was built at a settlement called Moscow, near Cincinnati, in 1816. It was supported by Cincinnati capital, and was operated between 1817 and 1819 by Pugh & Teeter. Moscow was later incorporated in the City of Cincinnati. I believe that they made some of our rare unidentified flasks.

Cincinnati had two glass-houses, employing eight glass-blowers, in 1851, the value of their combined output being $40,000. One of these houses was that of Gray, Hemingray, whose factory was built in 1848, on Hammond Street. Three years later the house moved across the river to Covington, Kentucky, and from there to Muncie, Indiana, in 1865.

Gray, Hemingray advertised that they made "a little of everything," and we must take them at their word after scanning the "partial list" of their output, including as it does "milk-pans, pitchers, decanters, other tableware, tumblers, lamp glasses, atmospheric fruit-jars, apothecary shop furniture, chemical apparatus, telegraph glasses, lightning rod insulators, perfumes, pickling bottles, bottles, lantern glasses for railroads, lantern glasses for steamboats." We also glean the following item: "A greater variety of Perfumery glass is manufactured at these works than at any in Pittsburgh.". . . "All the operations are of flint glass, except insulators.". . . "Sand, pearl-ashes and lead, are the main constituents of glass.". . . "The sand necessary for glass-works in Pittsburgh and Cincinnati is brought from Missouri, and the lead from Illinois, both at less expense to this point, than to

Pittsburgh; and the pearl-ash always rules in price lower here than in markets of our sister state."

The census report of Hamilton County, Ohio, for 1820 mentions a glass-house (unfortunately, no name is given) which was then producing "window and hollow-ware, chemical and philosophical apparatus." This industry probably got under way about 1816. The value of its production in 1820 amounted to $19,000, but the works "languished" owing to the fact that the demand for its ware did not equal the supply. We have a suspicion that it made too much "philosophical apparatus" for the needs of the times.

Tuscarawas, Stark, Cuyahoga, Coshocton, and Wayne counties, Ohio, had early glass-furnaces of very small capacity which operated but a few years, and about which nothing is recorded in local histories or State records.

Mantua, an early settlement in Portage County, made a few brave but brief attempts at glass-manufacturing. David Ladd and Jonathan Tinker, who had migrated from Connecticut, were the heads of the first industry, and "a glass-blower was secured" after a tannery built by Tinker's brother had been converted into a bottle-glass furnace. It started operations in 1821, when Mantua (like the other villages in this section of Ohio) consisted of scarcely more than a few log houses, a mill, and a tavern. Milk-pans and bowls were blown, as well as bottles for medicinal and spirituous uses.

David and Jonathan did not follow in the footsteps of their biblical namesakes, but separated in a year's time. In 1822, David Ladd moved to a near-by

village called Carthage, and the following year Jonathan Tinker left Mantua for Franklin Mills. Each of these men later built a little glass-house on the Cuyahoga River, using the sand from the river banks for silicate and the adjacent timber for fuel. Carthage and Franklin Mills were so close together that in 1832 they consolidated, and were incorporated as the Town of Kent. In 1824, James Edmunds, Henry Pauk, and a brother of the latter built a small glass-house beside the stream at Franklin Mills, on property belonging to a man named Cackler. The house operated in a small way until a year or two after the settlements consolidated.

The output of these four glass-houses, according to the best indications, was cylinder or window glass, hollow-ware for domestic use, some small apothecary vials (possibly other "chymical" supplies), and bottles. The glass which I have seen and might attribute to these little factories was light green, and fairly coarse. One or two abandoned cabins are still standing in Portage and Summit counties, whose small glass panes were probably of this origin. Reamed-edge milk-pans and several peculiar vase-like pieces have turned up in this section which are assigned to the Mantua group by local tradition. It is said that fragments of insufflated glass have been found about the ruins of some of these works. I have no proof whatever regarding the locality from which Ladd's one glass-blower came, but without hesitancy would say Connecticut.

Woodward's and the Black Horse Tavern, two famous hostelries in the pioneer days of Ohio, gave rest and refreshment to hundreds of travelers moving on to farther western points. These travelers needed

glass, especially bottles; while the Portage Path became a great artery of trade over which carboys and demijohns were taken by the hundreds up to Lake Erie.

Several progressive citizens of Kent banded together to promote a glass-works in 1849. They purchased a site, but lack of capital prevented them from completing the buildings until June, 1851. The owners were Charles H. Kent, Marion Kent, George H. Wells, H. M. Grennell, Horace Sizer, and Joseph Lyman; they held eight hundred shares of stock valued at $20,000. The firm was known as Kent, Wells & Co., and the production consisted of bottles and hollow-ware. In 1864 the plant was sold to Day, Williams & Co., who adopted the trade-name of the Rock Glass Works. At the close of the Civil War, one hundred employees were on the pay-roll, the capacity production being increased to seventy thousand boxes of window-glass a year. I believe that prior to 1864 this Kent industry turned out a large quantity of swirled bottles, of the "Zanesville type" and the "Stiegel type." The metal was very good, and the colors ranged from very light green to a bluish green and amber.

According to some accounts, a glass-works known as the Ravenna Glass Co. was built at Ravenna in 1857, operating until 1864 and including in its output historical and pictorial bottles and flasks. Other accounts state that the company was established in 1864. However this may be, we know that the Ravenna Glass Co. was incorporated in 1867, by F. W. Coffin, George Robinson, D. C. Coolman, H. H. Stevens, and J. D. Horton, the promoters adopting

the trade-name of the Diamond Glass Co. By 1874, Coffin and Stevens had withdrawn; and in 1885, Robinson disposed of his interests. Ravenna, with several window-glass factories in the seventies, became the seat of a flourishing glass-trade, the Diamond being a window-glass and bottle house. The windows in the Ohio building at the Philadelphia Centennial Exposition of 1876 were furnished by this works.

The quality of glass used in the Ravenna flasks, especially the earlier ones, was very good; the colorings were generally aquamarine but occasionally light and medium-toned blue, amber, bluish green, Nile blue, emerald, and grass-green. The sizes of the flasks run from half-pint to quart, the quart size being rare. The calabash bottle is found in only the one standard size. Mr. C. Jacoby of Wooster, Ohio, recently found three unusually beautiful blue Ravenna "Jeny Linds," in the homes of three elderly sisters, each of whom had been given one of these bottles as a memento of the singer. On the Ravenna flask the word "Jenny" contains but one "n." The quality of the metal in the "Jeny Lind" calabash is superior to that used in the general run of flasks.

This house also produced a wine or molasses bottle, with handle, bearing a sheaf of wheat on the obverse, and a rake and fork on the reverse. The size was about one quart, and the colors were usually amber or aquamarine.

Other Ravenna flasks are:

1 Obverse: "Ravenna" in semicircular panel above large anchor and rope, below which is word "Glass," and underneath that the word "Company" in semicircular panel. Reverse:

Eagle, shield on breast, perched on branch. Eagle's head facing left, above which are thirteen stars.

2 Obverse: Large central eight-pointed star, "Travelers" above star, "Companion" below. Reverse: Large sheaf of wheat, pitchfork, and rake.

3 Same Obverse as No. 2. Reverse: Large eight-pointed star, "Ravenna" above and "Glass Co." below star.

4 Obverse: Large five-pointed star. Reverse: "Ravenna Glass Works" in large letters.

5 Obverse: Plain. Reverse: Same as No. 4.

The factors of fuel and transportation being of primary importance in the selection of sites for the establishment of early manufacturing enterprises, the glass-trade soon seized upon Jefferson and Belmont counties, Ohio, as desirable locations for the industry. Coal lay in great abundance in the hills which rose adjacent to the banks of the Ohio River, while sand from the Hancock beds was only a few miles away. The later discovery of natural gas in the Ohio-West Virginia fields and in Indiana, led to greatly increased production, Indiana becoming in more recent years one of the great glass-producing sections of the world.

In 1830 a glass-furnace was built along the river's edge in the little town of Steubenville by Kilgore and Hanna, former Pittsburgh glassmen. Owing to the brittle quality of their metal (it is thought they utilized the adjacent river-bed silica), which they were unable to overcome, they failed, the small production including rather crude light-green paneled tumblers about four inches in height, bottles, flasks, and other hollow-ware. The tumblers, full of "tears" and fashioned in uneven manner, are finding places in many discriminating collections.

In 1845 the abandoned works was bought by Joseph

Beatty and Edward Stillman, who also purchased additional property and erected new buildings fronting the Ohio River, on Benton Street. The firm was known among the trade as "B. & S."; or Beatty & Stillman. The firm ran its new furnace for only a year or two, selling out to David and Neal Hall (or Hull), who in turn were shortly succeeded by Knowles and Taylor.

The old factory was turned into "private dwellings" for the workmen, and Knowles and Taylor put up a new works, including a flint-glass furnace, on Third Street, between South and Slack streets. Here they began making blown and pressed tableware, and specializing in goblets and tumblers.

In 1850 or 1852, A. J. Beatty took over the business, which rapidly expanded under his management. In 1862 the old buildings were razed, having become out of date, and a new building with "2 chimney stacks and 4 times the furnace capacity" was built. The new furnace made nothing but tumblers and goblets, and Beatty was soon leading the country in his output of these articles. Tumblers and goblets were shipped to every port in the world which received glass from America; and when production was at its height in Steubenville, Beatty employed one hundred and sixty hands regularly, 36,000 goblets and tumblers being the average daily output. It seems almost unbelievable, yet consumption kept pace with production at this and other houses. More goblets are broken than any other form of tableware, but there were other reasons than this why Beatty became the leader of the world in his product. His standards were high, the quality of the metal being somewhat above the average. Keen competition placed the goblet within the reach of every one's

purse. A great variety of patterns were utilized, including, it is said, every design (in some form) found upon American tables.

If you are a collector of goblets, and do not happen to live in Massachusetts and to have bought your glass at least ten years ago within the confines of that State, you can feel almost certain that at the very least, a small part of your glassware came from the Beatty factory. During the sixties, his daily production of goblets was greater than the total output of all the other houses in America combined! This Steubenville house managed to compete successfully with England, France, and Germany, whose cost of labor was so much lower than Ohio's. The secret lay in the lessened expense for fuel.

The glass-industry was a force in building up the town of Steubenville. It became the home of many glass-workers, who in later years (between 1870 and 1890) made an endless variety of colored pressed tableware. The factories had their own die and mold makers and their own large pot-houses. As peacock-blue, amber, and citron-colored glass became the rage during this later era, Steubenville led in the manufacturing of citron ("vaseline") glass. Quantities of fine "glass-eye" marbles and "plug-hat" toothpick-holders were turned out. The toothpick-manufacturers should have awarded Steubenville a *grand prix*.

In 1836 the firm of Wells, Henry & Co. erected a small furnace for bottle-glass on the site of the old Boreland coal-shaft in the Sixth Ward of Steubenville. Bottles were made here for nearly ten years, but no one seems to know anything about them. In 1846, Samuel Hunter, Justice G. Morris, and D. Foster took over

the abandoned furnace and began making window-glass and bottles; the company failed three years later.

I spent two days at Steubenville in an effort to learn something definite about these two early glass-houses. The sum total of the resulting information was that, in connection with the first company, "Henry, the business manager and salesman, becoming financially involved, the house failed." Henry then left rather hurriedly, according to an early historian, and "took his abode in the western states, where he is said to have lived in affluence."

CHAPTER XLVI

KNOX & McKEE OF WHEELING

The second glass-works to be recorded in what is now the State of West Virginia was erected in 1820 at Wheeling by George Carothers, formerly of Brownsville, Pennsylvania. Wheeling was at that time believed to be the coming metropolis of the West. The focal point for travel to and from Virginia, Kentucky, Pennsylvania, Ohio, Indiana, and the vast territory lying beyond these states, the town had become the Mecca for every westward movement and development of the decade. Round her tavern bars ebbed and flowed a human tide as forceful and vital as the waves of the mighty river which washed her banks. Lotteries and gambling devices flourished at this miniature frontier. News of the great outside world percolated in to the bars and the aristocratic drawing-rooms of the town's newly built dignified brick dwellings. A great human flotsam and jetsam demanded rum and corn whisky (and the bottle and flask which contained them) as a necessity of the times, in coping with swamps, snakes, wild animals, miasmic fevers, river-boat catastrophes, Indian attacks. The territory which we now term the Pittsburgh glass district could scarcely turn out enough bottles to supply the demand, and it was inevitable that this district should become the world's greatest bottle-producing section from 1810 to 1860.

Carothers, idealizing the existent conditions, believed that the time was ripe for launching an "elegant

glass-works." Over-ambitious to give the young settlements fine table-glass, he erected what was then considered a large factory. Production was started on a scale far too pretentious for the needs of the people. Isaac Craig made the same initial mistake at the little town of Cincinnati, although it is thought Craig did not attempt to blow "pretentious flint-glass" as we believe Carothers did. Cobalt-blue flint was "the rage" in Pittsburgh; perhaps its making was attempted at Wheeling also. At any rate, Carothers was soon disillusioned, and turned his plant into an eight-pot bottle-house. Bottles would sell when nothing else would. There was a vast amount of drinking and carousing as the early steamboats plied the Ohio. Many men lost the refinements of their former home life, and as the vanguard moved ever westward the bottles went with them. No stigma was attached to moderate drinking.

It is believed that Carothers did not stamp any of his containers, either with his own name or that of Wheeling. The sizes ranged from half-pint to one gallon.

After a brief period of operation, the factory was sold to two experienced glassmen from the East, who had tarried a while at Pittsburgh before going farther —Knox and McKee. Carothers was retained as superintendent, and during 1822 "cylinder-glass of good quality" was made under his supervision. The firm became widely known under the trade-name of "The Virginia Works—Knox & McKee, Wheeling." Its buildings stood in the Fourth Ward, and were later razed to make room for a schoolhouse.

The new glass-house owners became prominent in the commercial and social life of the town. Besides be-

ing manufacturers, they were commission and forwarding agents. Soon goods were being shipped "to Boston and the out-posts of New Mexico" and "to the ports of New England." Wheeling glass, without doubt, traveled far and wide. One of the impressions which I hope this book will convey is that an American-made bottle may conceivably turn up in the most remote corner of the world. England and Bohemia inundated us with decanters and wines; we, in turn, inundated the foreign trade with our bottles. The fragility of the glass and the carelessness of the consumers alone prevented quantities of early American flasks from being preserved. The present-day scarcity adds to their desirability.

Primarily a window-glass house, Knox & McKee steadily produced bottles as well. A letter written by Colonel McKee, probably sometime around 1830, reads in part:

> We continued the business satisfactorily for several years, turning out annually, I think, some 3,000 to 4,000 boxes of all sizes from 6x8 to 14x20, together with large quantities of green hollow ware; gallon and half-gallon, and quart bottles; oil and porter bottles and pint bottles innumerable. . . . Our No. 1 glass was of high repute, and bore transportation to distant points. . . . When prices declined from $12.00 to $3.50, we changed the concern into a white flint hollow ware factory under the name of Wheat, Price & Co.

The trade-name of Fairview Glass Works, occasionally met with on a flask, was then adopted. The main difficulty which these early manufacturers encountered was that they were compelled to sell their glass almost entirely upon long credits, with frequent renewals; this took too great an amount of capital, and failure often

resulted. This was probably the fate of Knox & McKee.

Two years ago, and again more recently, I spent several days in Wheeling in an endeavor to learn all that was possible concerning the early history of her glass-industry. As usual, even with the assistance of an efficient librarian, I could gather only a small number of data. There has been mention in a government report of a letter about a Wheeling glass-house in 1810. I could not lay hands upon any documentary proof of such a house. Rumor, however, persists that a small bottle-works was in operation at that date along the Ohio River, where crude bar goods were turned out for the taverns.

A flask made by Knox & McKee to celebrate the most auspicious event which had so far occurred at Wheeling is now one of the bottles most sought after by the collector. The Marquis de Lafayette, on his grand westward tour in the spring of 1825, stopped at the town, where he was received with the greatest of military and civilian honors. No man before or since has ever made such triumphal entry into the cities along the Monongahela and Ohio rivers. Everybody seemed to love him, and all vied with one another in showering him with honors.

Knox & McKee had been turning out a beaded-edge flask, on one side of which was a bust of Washington, and on the reverse a beautiful eagle with shield on breast, perched on an oval. A youthful portrait has been imprinted upon this glass—such a man as Washington may have looked when, as a surveyor, he made "the tour of the Ohio." Both Washington and Lafayette had brought prestige and popularity to Masonry, and the Panhandle district of Virginia boasted one of

PLATE 49 *Mr. P. Merkle; The Toledo Museum of Art; Mr. E. J. Knittle*

Providence salt
Keene ink

Kensington ink
Lyon salt

Pittsburgh salt
Sandwich ink

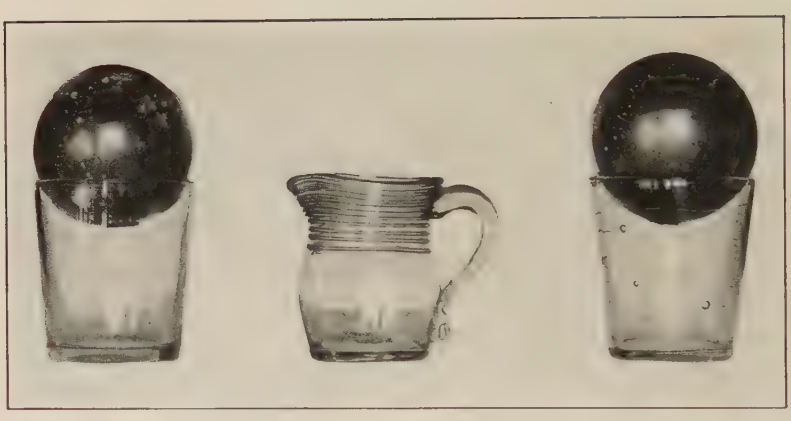


PLATE 50

Mr. George S. McKearin

"Offhand" glass from the Redford factory

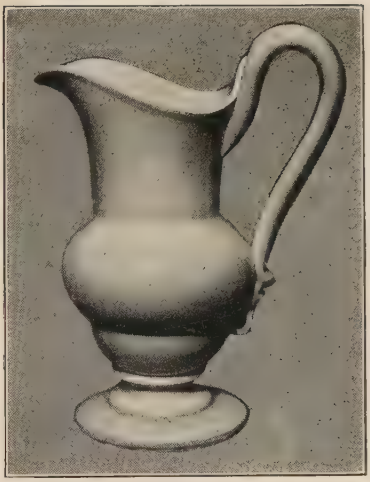


PLATE 51

Mrs. F. M. Nichols

Enameled opalescent mug — Opaque pitcher

Opaque and clear-glass goblet — Opaque lamp

All mid-nineteenth century

PLATE 52

Mr. George S. McKearin

Dense amber Saratoga glass

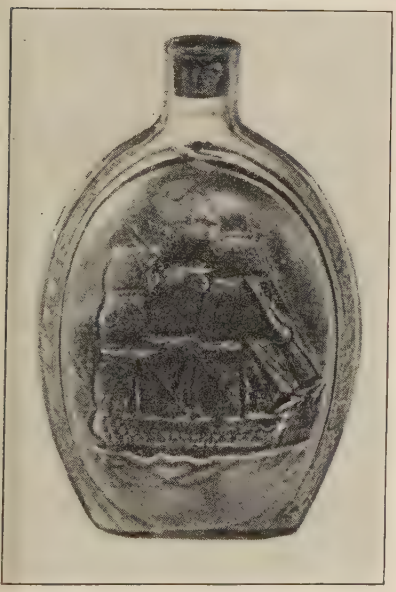


PLATE 53

Dr. J. H. West; The Toledo Museum of Art

"Kossuth" calabash

"Eagle, Free Trade and Sailors Rights" flask

Ravenna or Whitney calabash

Kensington cobalt flask

Mrs. Stephen Van Rensselaer

PLATE 54

Varicolored candlesticks (1830–50)

Mrs. William Olds

PLATE 55

Mid-Western hotel and river boat equipment (1835–65)

PLATE 56

Mr. Harry Hall White

Marked "Union and Clasped Hands" flasks

The Toledo Museum of Art

PLATE 57

Miniature paper-weight;
half section of weight
A weight made by Gillinder

Door-stop
Bottom of a weight showing
varicolored canes

Mr. Edson F. Schantz

PLATE 58

Various types of cup-plates

"Thirteen Hearts" "Bunker Hill" "Rose and Pansy"

"Chancellor Livingston" "Fort Meigs" "Fort Pitt Eagle"

PLATE 59 *Mrs. Wade Roberts*

Candlesticks—type made by Lyon, Jarves, Adams, Cunningham, Hobbs-Brockunier

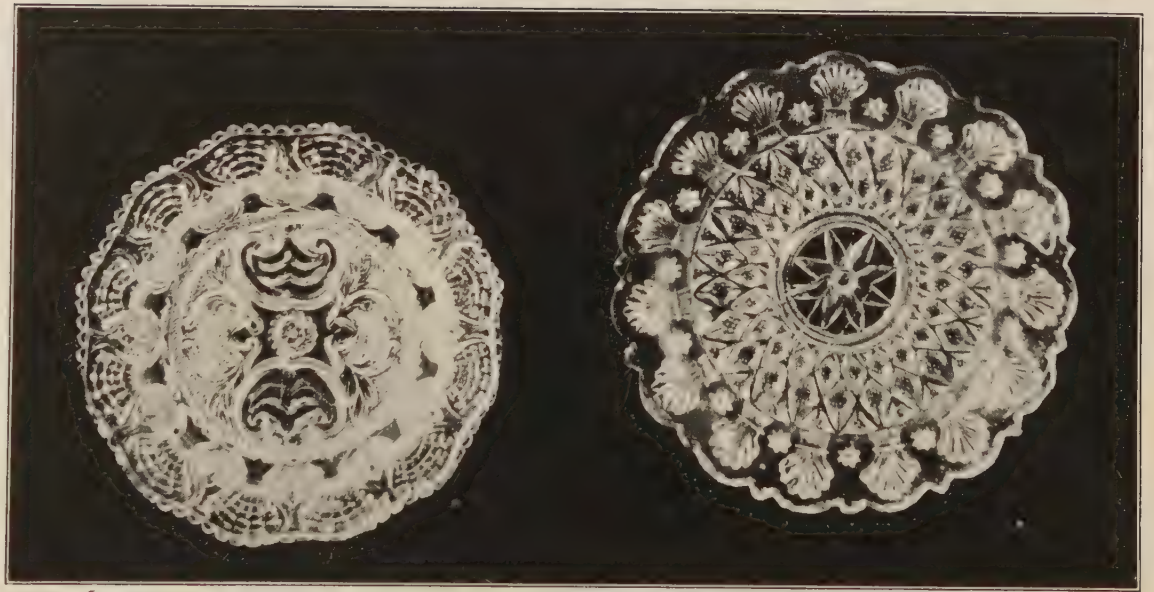


PLATE 60

Mrs. F. M. Nichols

Toddy-plates—New England Glass Co.

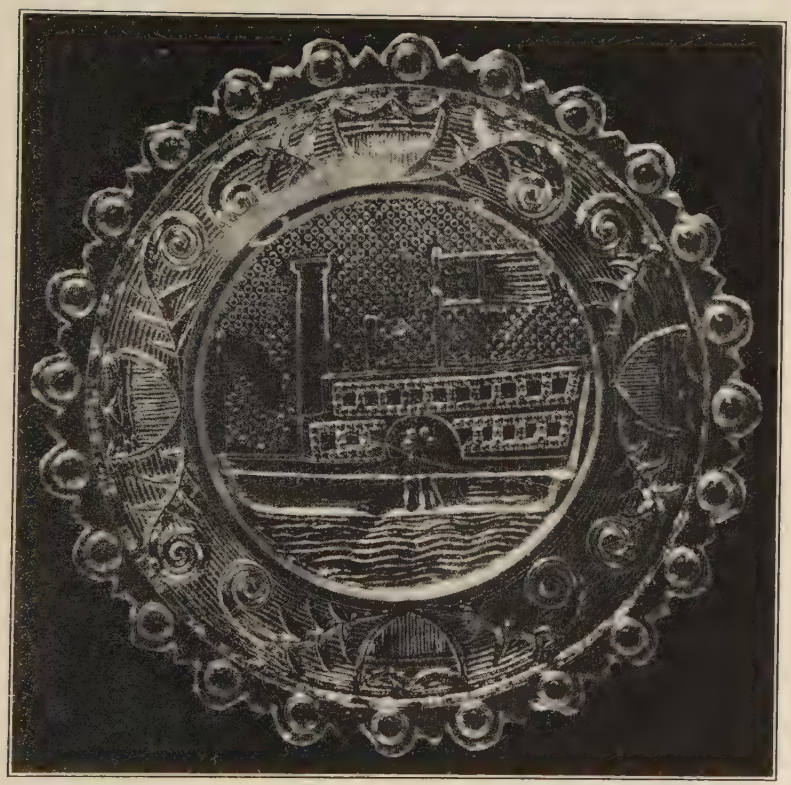


PLATE 61 *Mr. James H. Rose*

Circular Robert Fulton cup-plate—attributed to a mid-Western House

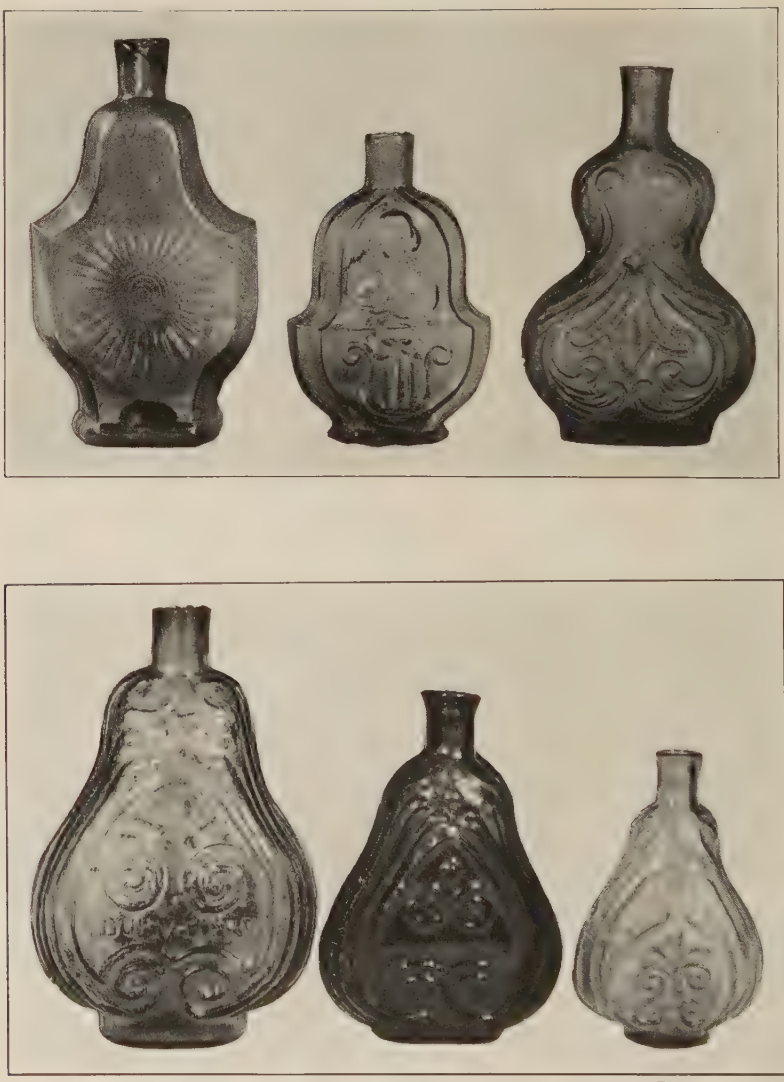


PLATE 62 *Dr. J. H. West*

"Violin" bottles and "Scroll" types of flasks

PLATE 63

Mr. Harry Hall White

Pittsburgh and Ravenna flasks

PLATE 64 *"Antiques"*

Glass patterns from the McKee catalogue

the first Masonic charters west of the Alleghanies. These enterprising glassmen now commemorated the event of Lafayette's visit by giving the world a beautiful Lafayette Masonic bottle. Fortunately, they stamped it "Knox & McKee—Wheeling." The bottle may be described as follows:

Large oval panel almost covering each side of flask. Heavy central ribbing, straight mouth (usually very crooked), deeply scarred base. Obverse: Bust of Lafayette in center of Masonic arch, fleur-de-lis underneath bust. "Gen'l. Lafayette" in large letters outside of oval. Reverse: Seven stars on oval; below, large eagle, shield on breast, rests on olive-branch and arrows; six cannon-balls below eagle; outside of oval panel, "Knox & McKee, Wheeling."

A number of flasks still listed as "maker unknown" are believed to have been made by this firm. It will be only a short time until sufficient proof is collected to establish definite "homes" for these flasks. Without question, the chestnut and swirled types of bottle were produced at Wheeling.

CHAPTER XLVII

THE WHEELING-MARTIN'S FERRY GROUP

For the sake of convenience, I have grouped in the present chapter the brief records of a few mid-nineteenth-century glass-houses each of which carried on operations, either simultaneously or at different times, both at Wheeling, West Virginia, and across the river at the town of Martin's Ferry, Ohio. Although operating in two different States, the Ohio houses were really considered West Virginia industries; they were usually capitalized by Wheeling money and, strange to say, were incorporated under West Virginia laws. Of two early houses in this section, only passing mention need be made. Michael and R. H. Sweeney, who later became leading figures in the mid-Western glass-industry, established their first house in the northern part of Wheeling in 1835. It was variously known as M. & R. H. Sweeney, the Flint Glass Works, and the Sweeney & Sweeney Glass Co. They later transferred their activities across the river to Martin's Ferry. The firm of Plunkett & Miller built a glass-works in South Wheeling in 1839, but soon moved to the other side of the river. The house (known also as the South Wheeling Glass Works and the Excelsior Glass-works) made numerous lighting-fixtures for the Ohio-Mississippi river boats.

In 1845, at the beginning of the exodus of glassmen from Boston to West Virginia and Ohio, James Barnes and John L. Hobbs left the employ of the New Eng-

land Glass Co. at Cambridge, came to Wheeling, and established a glass-factory there. Barnes had been superintendent of the crucible or pot room, and Hobbs the leading salesman, for the Massachusetts house. They were soon joined by their sons, who, although young, had received an excellent training in the New England factory. The older men, in the prime of life, were exceptionally able, and had hoped to form a long and successful partnership. Death claimed James Barnes in 1849, and a combination of unforeseen circumstances, foremost of which was the defeat of the idol of this part of the country, Henry Clay, for the Presidency, caused this glass-house temporarily to draw its fires. James F. Barnes and John H. Hobbs, the two sons, were also caught in the general crash, which affected nearly every field of manufacturing. Our Henry Clay cup-plates, designed to forward the cause of this orator, and produced in beautiful shades of blue as well as in clear glass, are a lasting reminder of the real tragedy his defeat meant to American glass-making.

The two younger men and the elder Hobbs built new and much larger furnaces at Martin's Ferry in 1854, after conditions had somewhat stabilized and collections were more certain. Their two furnaces held fourteen pots each. Hobbs, Barnes & Co. were at a distinct advantage on the Ohio side of the river, as a large coal-bank adjoined their buildings, the cost of digging the coal averaging only one and a quarter cents a bushel.

In 1845 the metal used by this house was composed of sand, pearlash, lead, and saltpeter. The output included "solar chimneys, lamps for lard oil, jars, vials, pungents, tinctures, salts, cologne bottles, tumblers."

From 1856 to 1858, the firm of Barnes, Hobbs &

Co., as it was then called, consisted of John L. Hobbs, John H. Hobbs, James F. Barnes, and J. K. Dunham. The discovery of petroleum in 1858 created a new and thriving field for glass-makers, and lamp-chimneys could not be made fast enough to supply the demand. Staggering quantities were blown daily by those houses that had immediately grasped this opportunity and added the new commodity to their list. "An oil lamp for every room" became the popular slogan, and the resulting demand brought prosperity to Barnes, Hobbs & Co., as it did to many other glass-houses.

Another commercial depression, this time affecting the entire nation, occurred in the early sixties. The call to arms at the opening of the Civil War not only caused a stagnation of consumption but took nearly every able-bodied man from the factories. By another year there was scarcely a young or a middle-aged man left in the town. The Barnes-Hobbs works closed down for six months.

A reorganization of the business took place at the end of 1863, the elder and the younger Hobbs and Charles W. Brockunier acquiring control, under the firm-name of Hobbs, Brockunier & Co. During the next decade this house assumed the foremost place among American makers of pressed glass. Several factors contributed to this result. A portion of the sand used for its better grades of glass was brought by the house from the Berkshire beds. The company also made three important innovations in the glass-industry: (1) The use of benzine in the "glory-hole" or polishing furnace; (2) the application of cold air to the molds for the purpose of chilling them; and (3) the introduction of soda-lime to take the place of litharge in flint-glass, thereby greatly reducing the cost of production.

The last-named innovation belongs to the credit of William Leighton, who had come to Wheeling from the Cambridge and Sandwich industries in 1863, and was at once placed in charge of the manufacturing operations of Hobbs, Brockunier & Co. Lime had been used for centuries in Europe in the making of window-glass, bottles, jars, and common tableware; in America it had been used in the composition of inferior tableware, but its employment had caused a lack of purity and luster which ranked the finished product far below that of lead-flint. After a succession of experiments, during which he substituted bicarbonate of soda for soda-ash, and used a different proportion of materials in the batch, Leighton turned out a lime-glass which equaled lead-glass in appearance if not in resonance and weight. The true relation of lime to glass, as a hardener and preserver, had been found after centuries of experimentation. Furnaces, tools, wage scales—in fact, the entire industry of flint-glass making—was henceforth changed. Glass became modernized in 1864.

William Leighton retired from the business in 1868, and his son (also named William) was admitted to the company in his place.

The firm of Ensell & Wilson built a glass-house east of Ohio Avenue, at Martin's Ferry, in 1849. For three years they turned out a large quantity of bottles and flasks. In 1852, Ensell & Wilson merged into Wallace, Giger, & Ensell, who ran the works for a few years. Dites & McGranigan were the next owners, and were soon followed by Hohn & Souner —the latter firm consisting of two Pittsburghers.

Just before the Civil War broke out, the house was

on the verge of failure, when Michael Sweeney of Wheeling and James Phillips took it over, establishing the well-known firm of Sweeney & Co. James McCluney, another experienced glassman who had learned the trade in Pittsburgh, put additional capital into the undertaking. In 1863, Joseph Bell entered the firm, and became president of the company, which from 1863 to 1867 was known as Sweeney, Bell & Co. In the latter year Bell withdrew, and the company then adopted the firm-name of Sweeney, McCluney & Co. This same year they vacated their old works on the West Virginia side, and concentrated all of their energies and money on the Ohio house, operating eight large tempering-furnaces and four coke-ovens. They also erected a large warehouse near the works, between Hanover and Carlisle streets.

Blown glass and bottles constituted the early production of this house. After the practicality of the pressing-machine had been demonstrated by the New England company, Jarves, and Lyon, the house installed the necessary apparatus and made an extensive line of both pressed ware and cut glass, specializing in lamps, candlesticks, and bar-goods.

Michael Sweeney has attained a permanent place in the history of glass-making as the inventor of an improvement whereby the inner surface of the mold is chilled to proper temperature, rendering the metal susceptible of the smoothest polish and giving the product a sharpness of outline almost equal to that of cut ware—a condition never before attained.

A decided novelty mentioned in brief accounts of this house is the fact that, of one hundred and fifty persons regularly employed, ten or fifteen were females.

The Wheeling-Martin's Ferry Group

In the spring of 1863 a group of workers at the Hobbs-Brockunier house left that concern and built a coöperative glass-works at East Wheeling. Organized with a capital stock of only $5000, the company suffered under three years of delay, internal disagreements, and general economic depression due to the war. In 1867 it bought the property of the East Wheeling Distillery and Pork Packing House, converting it into a flint-glass factory. Increasing their capitalization to $80,000, they were soon making pressed glass which has been characterized as "possessing variety, quality, beauty." The Central Glass Co. exported to Canada, South America, and the West Indies, and specialized in bar and lamp goods.

It is altogether impossible to identify or authenticate the greater part of the bottles, flasks, and hollow-ware made by the group of Wheeling-Martin's Ferry glass-houses which played such an important part in the industrial history of these towns. They were frequently controlled by Pittsburgh capital, and at times operated as complementary or branch factories. Molds were sent up and down or across the river. There was no perceptible difference in the quality of the various metals, the sand coming from the same beds and the metal-mixers doubtless migrating from one house to another.

From the revolutionary era inaugurated in 1864, at Wheeling and Martin's Ferry, until 1870, there was little change in the method of furnace-construction; the old type of round furnace with the coal fired over the bench, or the Frisbie "bucket-teaser" where the coal was pushed up from below, were used. Close competition led to larger furnaces, containing a series of flues by which hot air was introduced into the combustion

chamber, much greater heat being thus secured with much less fuel. Many of the newer furnaces, such as Arbogast built, held from thirteen to fifteen pots, and many of these huge metal pots held two tons of molten metal.

CHAPTER XLVIII

THE WELLSBURG, WEST VIRGINIA, HOUSES

THE "Panhandle," a narrow strip of territory extending northward from the main part of West Virginia, is so called on account of its peculiar shape. It comprises four counties, and bears the unique distinction of having been at one time or another a part of three states—Pennsylvania, Virginia, and West Virginia. It is not Southern territory, being at its northern extremity but a few hours' ride from Lake Erie. When the earlier glass-houses were built along the Ohio River, which separated the "Panhandle" from the State of Ohio, they were known as Virginia works, a matter which has occasioned confusion to some collectors not familiar with the peculiar location of this wedge-like piece of land.

The first glass-furnace in the "Panhandle" is recorded as having been erected in 1813 at Charlestown, Virginia—the present town of Wellsburg, West Virginia.[1] Isaac Duval, Nathaniel Carl, and John Carl built this furnace when the country surrounding the village was little less than a wilderness, an occasional log-cabin settlement being found on the Monongahela and the Ohio Rivers. Duval was both promoter and superintendent of the works, the company-name being Isaac Duval & Co. The surprising element in this un-

[1] To make this nomenclature still more confusing, there is a present-day Charleston, West Virginia, which has nothing to do with the old "Charlestown, Virginia," now Wellsburg, West Virginia.

dertaking is that it was not a cylinder-glass and bottle house, but a flint-glass furnace.

I spent two days in Wellsburg assembling the very scattered data concerning this house. The results of my inquiry pointed to the operation of a flint-glass works of an unusually meritorious character. This can be explained upon the grounds that Isaac Duval, who settled in Charlestown (Wellsburg) in 1804, had emigrated from New Bremen, where he had been one of the superintendents of the Amelung manufactory. The Carls were undoubtedly from the same place.

All the materials used at the plant, excepting the coal, were hauled over the mountains from the East, the clay for the pots being brought from Stourbridge, England. The government census report for 1820 records an annual production valued at $20,000, with yearly wages paid of $8000; the capitalization was $12,000, and materials on hand (including money in the contingent fund) were invoiced at $12,000. Fourteen men and twelve youths were kept busy working in the pot and furnace rooms, and in mining the coal.

The house ran along on a paying basis from 1818 until 1828, when Duval died; as the Carls, who were probably glass-blowers, could not manage the plant, it closed down.

An excellent grade of flint-glass was blown, Duval specializing in blue flint—which meant the cobalt shade of this color. Amber also was used, and I believe purple and emerald-green—though very rarely. Decanters and wines were advertised, which we are assured were "of great beauty and solidarity," the wine-glasses being "the most graceful and desirable the world over." Although our early glassmen were prone to exaggerate, there is no logical reason why Duval,

with his excellent materials and his experience, could not have made as good glass in this little frontier settlement as Stiegel did in Manheim. In crowning Stiegel king, we have too long neglected the rest of the royal family.

Enameling was common in the mid-Western works, a great variety of both transparent and opaque. "Friendship Mugs" being made in the various houses up to 1845 or 1850; the majority of these are erroneously called "Stiegel" or "Bristol."

John and Peter Blankinsop came to America from England in 1825, and after living at Gallipolis, Ohio, for two years they went to Wellsburg, Virginia. Being experienced glassmen, they took over the Duval or another idle works here, and began making window-glass and bottle-glass. At a somewhat later date the industry merged into what was known as the Riverside Glass House (it was situated on the banks of the Ohio River), the new members of the company at this time being a group of young Irishmen most of whom had recently emigrated to America from the Irish glass district, and S. George, a Wheeling banker and capitalist who furnished the money to extend operations. The Irish-Americans were named Gasmire, Brady, Dornan, McCarty, and Torreyson. It is thought that this change took place about 1838, and that by 1842 McCarty and Torreyson had bought out the interests of the other members of the concern. Bottles and flasks were produced continuously for more than a quarter of a century, although few of the flask models have been authenticated other than the marked examples and the violin-shaped "Jenny Lind." I feel perfectly safe in saying that the "Chestnut" hip-flask

types and the Stiegel and Zanesville swirled types of perpendicular-ribbed bottles were blown by these Irish artisans at the Riverside house.

John and Craig Ritchie built a flint-glass house in the second ward of Wheeling in 1829. It was constructed alongside a coal-hill near the site of the old Market House, thus conveniently eliminating the problem of fuel-transportation. Fragmentary notes regarding this concern in various records and histories read: "It was a success for a time, and they produced a large quantity of apothecary supplies and blown table ware." They made "flasks, vials, and household necessities." The firm maintained " a reputation for fine cut glass ware." They succeeded "on account of their unrivalled advantages for procuring cheap fuel," which they had only to dig out of the hill back of the factory. "It was this condition which encouraged other firms such as the Messrs. Sweeney to start a glass-house in Wheeling in 1835. (The Sweeneys were Michael and R. H., who became two of the leading figures in American glass-production.) Another forward step in connection with our native glass will be accomplished when types and patterns can be identified and authenticated as coming from the furnaces of John and Craig Ritchie. I do not know when or why the Ritchies stopped making flint-glass.

A window-glass factory was built on Main Street, in North Wheeling, by S. G. Robinson. I have not been able to ascertain the dates of operation. It was an early works, however, producing a considerable quantity of window-panes for the surrounding territory. The "corseted violin," or "corset-scroll" type of

flask, may have been made at this house, as some of these models turn up bearing "R.K.," the initials of Richard Knowles, a glass-blower for Robinson. Knowles probably succeeded Robinson, calling the factory the Union Glass Co.

George E. House and Dent Taylor operated a bottle-glass works in South Wheeling, Virginia, which was known as the Northwood Glass Co. It later merged into the firm of Hobbs, Brockunier & Co. This house probably made the glass canteen, eagle in center surrounded by a series of concentric rings, several examples of which have been found stamped with the mark, "N. G. Co."

The Lazerville bottle-works operated in the forties and fifties in southeastern Wellsburg, Brooke County, until it was destroyed by fire in 1857. I was unable in Wellsburg or Wheeling to find any definite material concerning this factory.

CHAPTER XLIX

LATER NEW YORK STATE HOUSES

The Ellenville Glass Co. began operations in 1836. Ellenville in Ulster County, on the Erie Canal, offered excellent shipping facilities for the company. The owners of the works were the group of men interested in the Willington and Westford, Connecticut, glass-factories, among them being Messrs. Merrick, Carpenter, and Shaffer. In 1866 the industry was disposed of to owners who changed its trade-name to the Ellenville Glass Works. Still later, the house was known as the Ellenville Glass Factory. Under the first management, demijohns, carboys, and various sorts of bottles were blown, also a general line of hollow-ware.

Lockport, so named from its famous locks at one of the Erie Canal terminals in 1825, became a noted town in the days of canal navigation, and a focal point for trade, travel, and shipping interests similar to Wheeling, Virginia, at a somewhat earlier date. A human tide floated through her gates in ever increasing numbers after the first quarter of the nineteenth century, many of the travelers being bound for the vast stretches of territory which lay beyond the plains and, later, the Rockies. Lockport was a logical place for the making of whisky-flasks, for seldom did a traveler go on his precarious way without a bottle of spirits. The first furnace was built in 1840 by a company of four men, whose names were Hildreth, Marks,

Keep, and Hitchens. They capitalized the concern at $15,000, which amount was later increased by $10,000; and from fifty to sixty-five men were employed in the business. Sometime during the 1850-60 period the other members of the firm sold out to Hitchens, who ran the works alone for a time, doing a business of nearly $50,000 a year. In 1872, under the ownership of Alonzo J. Mansfield, the plant was enlarged. One hundred hands were employed, and a yearly business of $75,000 was done.

The works was a bottle-glass house, specializing in flasks and, later, "atmospheric" fruit-jars. A fair-sized quantity of apothecary bottles also was intermittently made.

The metal was of ordinary or medium grade during the earlier years of operation, fairly thick, and made of sand, soda-ash, lime, and salt. During the 1870-72 period, the Lockport company concentrated its efforts on the making of amber flasks. While the flask-production was to a certain extent late, like that of the Ravenna works which it at times resembled, there is a naïveté about some of the patterns which appeals to the collector. Ducks floating around upon a glassy sea, "Will you take a drink?" and "Can a [picture of a duck] swim?" are found upon one of our most novel flasks. It was manufactured after 1864, but nearly every flask-enthusiast tries to land a "Duck" from Lockport.

The "Washington, reverse Taylor" model is a duplicate of the well-known bottle made at Kensington and stamped "Dyottville Glass Works." A variant is the "Washington" with a plain reverse. The desirability of these containers does not lie so much in their modeling or shape as in the colorings in which they

may be found; the colors include not only the ambers, greens, and blues, but (though very rarely) puce, rose, amethyst, and purple.

Eight experienced glass-blowers left Pittsburgh in 1849 and went to Lancaster, New York, where they built a furnace for bottle-glass. The fuel situation here was unusually favorable, owing to the hemlock forests which surrounded the town. During its ten years of operation, the house used an average of eight cords of wood daily, employed twelve men, and turned out thirty to thirty-six dozen flasks and vials each working day. The buildings burned to the ground in 1859; but the factory was shortly rebuilt, and was operated under various managements until twenty years ago. The house has been owned successively by the following: Reed, Allen, Cox & Co.; Shinn & Co.; James, Gatchell & Co.; James & Gatchell; Dr. F. H. James; and the Lancaster Co-operative Glass Works, Ltd.

Fortunately for us, the Lancaster house stamped some of its flasks, although others are unmarked. Its sea-green "Success to the Rail Road," with the engine on both sides, is considered the chief Lancaster prize at present. Mr. Van Rensselaer states that these flasks must have been made by other factories, on account of the variation in the mold marks, yet he has been unable definitely to assign them to any other bottle-house. These "Railroad" flasks were made to commemorate the opening of the railroad in this part of New York State, as were the others in their various vicinities.

While it has not been established how many designs were made at Lancaster, the house copied to a great extent, taking the Kensington, Whitney, Lowell, and

Pittsburgh designs as models. But with this difference: the incising of the molds was extremely free of hand, the desired effect being conveyed by fewer but more artistic strokes than on numerous other flasks. The patterns lack the set, formal, and sometimes strained appearance of many flask-patterns, producing an effect which is particularly pleasing to the eye.

The Lancaster flasks are found in half-pint, pint, and quart sizes. The two former are the more common, but the rare "Scroll" bottles stamped "Lancaster Glass Works" usually turn up in quart size. The latter are very similar to the Louisville "Scrolls," though they have the same free-hand effect in pattern mentioned above. Both of these types are found occasionally in beautiful shades of blue, in the general range of ambers, in a great variety of greens, and in a very unusual lavender-tinted milk-white glass bordering upon the opalescent—a coloring found in few bottles. Half-pint, pint, and quart flasks are known in this latter color.

Regarding the "Scroll" type in general, it may be noted that several rose-colored specimens have been found; while Mr. Earl J. Knittle has had royal-purple, cobalt, and amethyst examples. Dr. James Herbert West, one of our prominent bottle-collectors, has eighteen different colors in half-pint "Scrolls"; twenty-nine color varieties in the pint size, and thirty in the quart. Three colors in the half-gallon size have recently come to light—aquamarine, a deeper green, and a pale amethyst. The "Scrolls" make an exceedingly interesting collection, for it is possible to own five hundred of these bottles, including the waisted types, and still have no duplicates. I have seen marked "Scrolls" from Lancaster, Louisville, Pittsburgh, Wellsburg, and Wheel-

ing; and I believe that at least five factories made them in Pittsburgh, and two at Zanesville.

The "Cornucopia, Basket of Fruit" flask is found in a variety of colorings, including blue, the stamp on this model being "Lancaster Glass Works, N. Y." above the basket of fruit. Lancaster also made a Masonic flask and the well-known "Flora Temple" bottle commemorating the famous race-horse, in lovely greens, ambers, and (very rarely) blue. In the later days of its activity, this bottle-house made thousands of containers for Log Cabin Bitters, Hostetter's Bitters, Fish's Bitters, Gargling Oil, Duffy's Malt Whiskey, Warner's Safe Cure, and many other nostrums which a thirsty and ailing populace consumed. In our rural districts alone, millions of bottles of these patent-medicine cure-alls, nearly all of them containing a high percentage of alcohol, were emptied during the past century.

Anthony Landgraft, a German glass-blower, erected the Cleveland Glass Works at Cleveland, New York, in 1840. The following year a fine grade of sand was discovered on the property, after sand had been brought by boat from Oneida Lake for twelve months. Two other small furnaces were built in the same neighborhood during the forties, but no authentic data have come to light concerning them or their productions.

The Durhamville glass-house was built in 1845 by DeWitt C. Stephens. After operating it for only a few months, Stephens sold out to Fox, Gregory & Co. The industry, a cylinder-glass works, was also variously known as Fox Brothers, Fox & Son, and Fox

& Co. "Offhand" articles were occasionally blown here, and the house was still operating in the seventies.

With only a thousand dollars of capital, Christopher Doerflinger started a glass-works on Concord Street, Brooklyn, in 1852. The furnace held only five pots, but the capacity was soon increased to seven pots as finances improved. In this flint-glass works, operated for the production of "blanks," Doerflinger made such an excellent grade of metal that his first year's sales totaled $30,000. By the end of nine years he had four large furnaces in operation, the plant growing until its output equaled that of any in the country. In 1865 Doerflinger was employing eighty-five workmen, while his sales reached the $300,000 mark. A second glass-house, for the cutting of "blanks," was built by him at Green Point, Long Island, in 1858, being managed by Hoare & Daily from 1860 to 1865.

Brooklyn and its environs became the seat of an extensive glass-cutting business, whose output consisted mainly of decanters and glasses, lamps, lamp globes, prisms for lamps, chandeliers and girandoles, and other lighting appurtenances. The manufacture of lamps increased steadily until the adoption of gas for lighting purposes; this ruined the lamp-industry, and caused the failure of many of the Brooklyn glass-houses.

The Union Glass Works of Somerville, Massachusetts, was taken over by the South Ferry Glass Works of Brooklyn, in 1864, and was operated by the latter until 1868. The company then moved to Corning, New York, and in 1875 was reorganized

as the Corning Glass Works, by which name it is still known as one of the largest and finest in the world.

Buffalo and Newburgh each claims a mid-nineteenth century glass-house, but these two works have apparently missed the attention of local historians. New Lebanon had a little bottle-works; but it was started, like many of the more western houses, too late to come within the scope of the present volume.

In 1852, Bernard's Bay became the site of a glass-furnace, constructed there by Stevens, Crandall & Co.

Thomas E. Walker operated a flint-glass works in New York city in 1830. McCord & Shiner also were listed as glass-makers in this year. The South Ferry Glass Works of Brooklyn was owned by Emory Houghton, Sr., and the Houghton family is still making glass on Long Island, with offices on lower Broadway, New York. There were a number of other flint-glass houses operating in Brooklyn between 1840 and 1865.

A group of East Cambridge glassmen left the New England Glass Co. in 1820, and went to New York city, where they started the making of flint-glass, under the firm-name of Fisher & Gillerland. Buying the old Glass House Farm property, they remodeled the buildings, and for three years turned out glass similar to that being made contemporaneously at the Massachusetts works.

John A. Gillerland withdrew from the firm in 1823, and went to Brooklyn, where he established the South Ferry Flint Glass Works. The latter industry was operated with great success and skill until late in the fifties,

at which time trade conditions became so uncertain that many of the Long Island houses failed.

At the great International Exhibition held in London in 1851, John Gillerland was awarded a medal for the finest lead-flint glass exhibited there—a remarkable triumph, considering the keen European and American competition. This glass possessed an unusual brilliancy, its refractory power being greater than that of any other contemporary ware. This refractory quality was the aim of all cut flint-glass manufacturers the world over, but its acquirement was one of the problems of the day. Much of our fine cut glass of the forties and fifties came from the Gillerland furnaces.

The Gillerland family had been connected with the glass-industry for years, having as wholesalers imported flintware from England prior to 1776. The shop of James Gillerland, Importer, was located on Wall Street, New York, in 1760, the place being a center for Delft ware and English glass.

John Gillerland was considered the best metal-mixer of his time in America. Many of his decanters and wine-glasses cannot readily be distinguished from the imported ware.

CHAPTER L

THE KENTUCKY GLASS WORKS

Although the eight German glass-blowers who had come to America with John Frederick Amelung left Maryland at the close of the eighteenth century for the purpose of establishing a glass-works at either Maysville or Louisville, Kentucky, it is probable that they all went to Fayette County, Pennsylvania, to operate the Gallatin-Nicholson undertaking. There has, however, always been a local feeling that Louisville had a little pioneer glass-industry, but no records can be found to support such an assumption. Several years ago, Mr. Harry Hall White, one of our leading bottle-collectors, made an exhaustive inquiry into Kentucky glass-manufacture, finding no data regarding any enterprise earlier than 1840. In that year a glass-cutting shop was opened in Louisville by H. & T. Hunter, their "blanks" coming from one of the Pittsburgh works. A second glass-cutting industry was started in 1845; but no record so far found mentions the erection of any glass-furnace before 1850.

H. & T. Hunter sold glass for "brooches, miniatures and watches," and "could furnish table-sets and replace and match broken decanters." Most of the liquid refreshment served in hotels and taverns, on board the river boats, and in private homes during the mid-nineteenth century was kept in decanters, many of these being elaborately cut, as were also the wine-glasses. The Hunter brothers were kept busy cutting,

etching, and engraving this type of glassware from the forties to the seventies—the years which marked the great expansion of the Ohio-Mississippi steamboat travel. Cincinnati and Louisville furnished three fourths of the equipment for these side-wheelers, including a large portion of the fancy glass panels for the cabin doors and windows, and the elaborate cut-glass chandeliers which Mark Twain described as "ravishingly beautiful." The hotels of the middle West were as flamboyantly equipped as the boats. Little of these glass furnishings has been salvaged; of that little, some is very beautiful, and some frightfully ugly.

The Louisville directory for 1850 and 1851 lists the stockholders of the Kentucky Glass Works, but does not give the date of incorporation or of the first firing. Fifty hands, of whom twenty-one were glass-blowers, are said to have been employed during the early period of operation, so the works must have started in a rather large way.

It is not definitely known if the directors of the factory came from a glass-works in some other city, such as Pittsburgh, or if the stockholders were made up of experienced glassmen from the West Virginia-Ohio factories; their names are found in the industry of all three sections. Undoubtedly some of them were sons or grandsons of the Glassboro and Maryland artisans, for Horace Greeley's admonition to the young man would never have been necessary to the glass-blowers along the Atlantic seaboard—they possessed the westward urge in all its intensity. Among the names of the men connected with the works were Stanger, Doyle, Leopold, Ramsey, Greiner, Mowrey, and Bedenburg—the latter a pot-maker.

Almost before operations were under way, a change

of management occurred, the "Courier" of November 28, 1850, printing the following notice:

KENTUCKY GLASS WORKS

Geo. L. Douglass and James Taylor having purchased the above works, have formed a partnership, under the name and style of Douglass and Taylor.

They have a good stock of ware on hand, and will fill promptly orders for all description of green and black glass-ware, consisting of fancy and plain vials of every description; Packing, Porter, Mineral and Wine Bottles, Pickle and other Jars, Flasks and Demijohns.

☞Particular attention paid to private moulds.

Orders by mail, or left at Casseday and Hopkins store on Main near Third Street or at the Works on Clay Street near Main will receive prompt attention.

John Stanger and William Doyle, two members of the original company, retained an interest in the plant;

A Pearl Dentrifice, for removing all substances destructive to the teeth, for sale by
au12 S. D. CHOATE, Fifth st.

KENTUCKY GLASS WORKS.

TAYLOR, STANGER, RAMSEY & CO., Manufacturers of Vials, Demijohns, Porter and other Bottles, of every description, are now in full operation and ready to receive orders, at their establishment on Clay, near Washington st., Louisville. Orders left at Casseday & Hopkins' store, on Main, near Third street, will be promptly attended to.

☞Particular attention paid to private Moulds.
au12 d1y

CRUDE SALTPETRE.—40 bags, warranted pure, for sale low by
au12 CHARLES GALLAGHER.

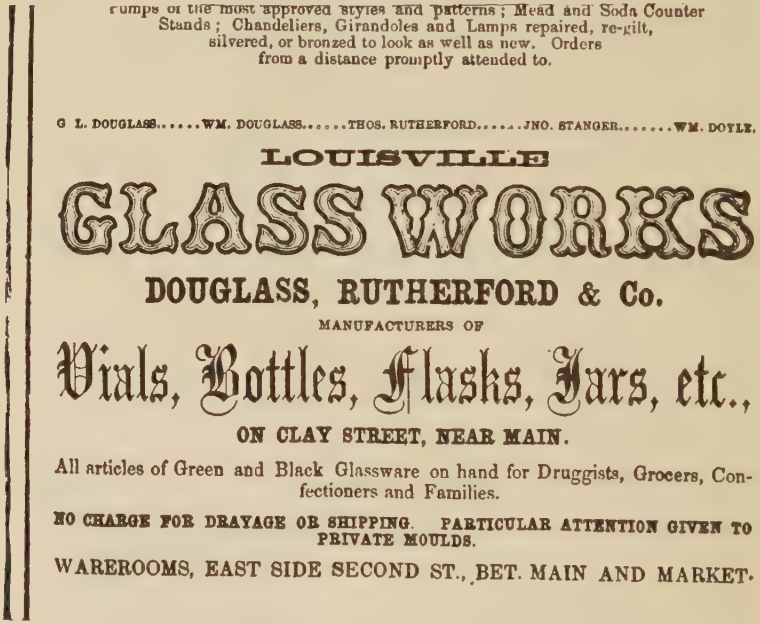
they probably acted as "gaffer" and "boss-blower" during the operations of the Kentucky Glass Works. George Douglass was a rich planter, who put additional capital into the concern. In 1854 or 1855, William Douglass and Thomas Rutherford took stock in the company, which was then running on a paying basis.

In 1856 Dr. John A. Krack purchased a half-interest in the firm, which was then operating under the name of the Louisville Glass Works. It is thought that Dr. Krack took over the Douglass and Rutherford shares. Soon thereafter the house adopted the firm-name of Krack, Stanger & Co., and the trade-name of the Louisville, Ky., Glass Works. It improved and enlarged production, erected a warehouse on the corner of Clay and Franklin streets, and added various new lines to the output, including tumblers and goblets, coal-oil lamps, "trimmings," etc., and continued to specialize in grocers', confectioners', and druggists' supplies.

Stanger severed relations with Dr. Krack in 1868, the firm becoming J. A. Krack & Co. It continued under that form until Leander and William Reed took an interest in the concern, when it became Krack, Reed & Co. In 1871, Krack sold out to the Reed brothers, the firm adopting the name of L. S. Reed & Brother. Business declined rapidly after John Stanger quit the company, and the Reeds failed in the early seventies.

Although the Louisville glass-works made any number of articles for the trade, it has become famous among collectors for two types of bottles which were manufactured in a number of variants: (1) the heavy perpendicular ribbed whisky-flask; (2) the "Scroll" or "Violin" bottle for camphor and whisky which was an

outgrowth of the "Jenny Lind" and the marked McCarty and Torreyson pint and quart flasks of violin or fiddle shape which were previously produced at the Riverside Glass Works of Wellsburg, West Virginia.


Pumps of the most approved styles and patterns; Mead and Soda Counter Stands; Chandeliers, Girandoles and Lamps repaired, re-gilt, silvered, or bronzed to look as well as new. Orders from a distance promptly attended to.
G. L. DOUGLASS.....WM. DOUGLASS.....THOS. RUTHERFORD.....JNO. STANGER.....WM. DOYLE.
LOUISVILLE
GLASS WORKS
DOUGLASS, RUTHERFORD & Co.
MANUFACTURERS OF
Vials, Bottles, Flasks, Jars, etc.,
ON CLAY STREET, NEAR MAIN.
All articles of Green and Black Glassware on hand for Druggists, Grocers, Confectioners and Families.
NO CHARGE FOR DRAYAGE OR SHIPPING. PARTICULAR ATTENTION GIVEN TO PRIVATE MOULDS.
WAREROOMS, EAST SIDE SECOND ST., BET. MAIN AND MARKET.

Occasional bottles of these two main types are found stamped with the name "Louisville Ky. Glass Works" in a panel or scroll arrangement, or with the mark "Ky. G. W. Co." on the bottom of the flask. The great interest that collectors are taking in this bottle is due to its slight variations of pattern, its many different colorings, and its unusual variety of sizes, these Kentucky flasks being made in an occasional ample two-quart size—an extreme rarity in our early bottle-glass

industry. The usual sizes met with are the half-pint, the pint, and the quart. The neck is frequently very long.

The stars in the scroll (provided the motif is not a fleur-de-lis or an anchor) may be five, six, seven, or eight pointed, and the stellar motif may vary on the obverse and reverse of the container. One, two, three, or four stars may also be found on these bottles.

Having lived in a section of our country where the majority of these bottles are found, I have had exceptional opportunity for noting their wide range of colors. I can thus guarantee the following color-table as absolutely authentic, having seen and in the majority of instances owned a specimen of each. (The only known royal-purple quart "Scroll" Mr. Knittle found in an abandoned livery-stable; it was in proof condition!)

clear glass
aquamarine
light green
sea-green
yellow-green
bluish green
emerald-green
grass-green
sage-green
olive-green
citron
puce
claret
rose
milky glass
opal
lavender
amethyst
royal purple
sky-blue
ultramarine blue
cobalt blue
canary
light amber
dark amber
olive amber
brown
red-brown

The Kentucky Glass Works also made interesting arched types of capers and pickle bottles, paper-weights and door-stops, and the usual forms of impedimenta which landed on the "what-not" or hung by a light-blue satin ribbon from the wall—canes, majordomo sticks, rolling-pins, horns, pipes, ships, miniature arti-

cles and dolls' dishes for the children. Whatever artistic merits are manifest in the output of this house, we probably owe to one person—John Stanger.

A flask which has bothered many a glass-student is the one, generally found in two-quart size, which is marked "Farley & Taylor, Richmond, Kentucky." As Richmond never had a glass-works, this Eagle-pattern bottle is now believed to have been made by the Louisville works for Farley & Taylor, who owned a general merchandising store in Richmond. As Taylor was one of the earlier stockholders in the Kentucky Glass Works, the flask is probably one of the first that was made at this house.

CHAPTER LI

A FEW SCATTERED HOUSES

GOVERNMENT census reports declare that no early glassware was made in the States of Maine, Rhode Island, and Delaware. But when it comes to the subject of early American glass, we find that even government statistics are very likely to prove erroneous. The salt-cup illustrated in the present volume proves conclusively that Rhode Island made pressed flint-glass, if only for a very short time; and the "Providence Journal" for January 31, 1833, speaks of the Flint Glass Co. of Providence as producing some of "the best and most elegant ware in America." The lighting-devices in the old Providence City Hall are said to have been made locally.

In 1752 the General Court of Rhode Island passed an act granting Isaac C. Winslow, *et al.*, the sole privilege of glass-making in Providence, but it is believed that the permit was never acted upon. Various historians also state that in 1790 a works was being operated by John Brown at India Point, but that the fires were drawn immediately after the first melt. It is hoped that we may soon have more definite knowledge of the glass-production of this State.

Next to nothing is known concerning the glass-house supposed to have been built by a certain Dr. Adams at Richmond, Virginia, in the earlier half of the nine-

teenth century. It is possible that it operated only a short time.

Deming Jarves tells us that Adams made large offers of increased wages to the workmen of the Essex Street Works, who were thus induced to abandon their places and violate their indentures. They succeeded in reaching Richmond to try their fortune under the auspices of the doctor; but after a brief period of very heavy losses, the works was abandoned and the workmen thrown out of employment.

James B. Eads, the well-known builder of the first great bridge across the Mississippi River, was the moving force in the establishment of a glass-house at St. Louis in 1842. The first output consisted of flintware tumblers and other table requisites. Eads and his associates were handicapped from the outset by not being able to induce experienced hands to go to Missouri to run the factory. In desperation over the situation, Eads finally made the pots himself, in an effort to stave off failure. Five years of toil and worry were the only result. At the end of 1849 he and his associates, finding it impossible to continue, and financially embarrassed, were forced to suspend payments and abandon their efforts. To the credit of Eads it should be noted that in after years every dollar of indebtedness which the firm had incurred was liquidated by him. The first glass-making effort west of the Mississippi River ended in failure.

The buildings were purchased by a group of men who converted the former flint-glass plant into a green-bottle house. In 1854 it again became a flint-glass works. In 1855 or 1856 a green-bottle glass-furnace was erected, in addition to the one making flint-glass.

Bayot & Cummings bought the factory sometime before the outbreak of the Civil War, and turned it into a white-flint bottle house.

In 1807, Andrew Way, Jr., Jacob Curtis, Horace H. Edwards, and Solomon Stinger (Stanger) erected a glass-works in Washington, D.C. In 1809 the firm was operating under the name Edwards, Way & Company and had the reputation of producing the finest window-glass of the day, Bohemian workmen having been imported to attend the furnace rooms and the blowing. "Offhand" objects such as pitchers and tumblers, and wines, in the collection of Mr. George S. McKearin, attest the high quality of the metal from the pots of this factory. From August, 1818, until October, 1820, the works were closed, but apparently the furnaces were re-fired in 1820, and the business carried on until 1829, by Andrew Way, a brother of George Way, who died in 1821. In 1838 the house advertised in the "National Intelligencer" under the trade-name of "the Washington City Glass Works," the Superintendent being F. Stinger. The plant was offered at auction in June, 1843, but no sale was made. The metal was exceptionally clear and pure, and a few authenticated specimens of hollow-ware blown by these Bohemian-Americans are engraved with a daisy and leaf motif. Clark's Glass Works of Washington, D.C., was blowing hollow-ware of a utilitarian nature in 1850.

Glass-making was begun in California in 1863, but nothing is known about the works.

PART V

Two Hobbies of the Collector

CHAPTER LII

SOME NOTES ON CUP-PLATES

The custom of drinking tea from the saucer instead of from the cup originated early in the nineteenth century, and was very generally practised in both England and America. This was a graceless custom, but it has afforded the present-day china and glass collector a hobby which, once pursued, is seldom relinquished—that of collecting cup-plates.

These little receptacles for the hot or dripping tea-cup were from two and three quarters to three and three quarters inches in diameter, and were used for the purpose of saving the table or its linen from marks or stains, or of protecting the tea-tray from injury. The china cup-plate was first made in England, but it was not long before the American pressing-machine began to displace the imported china plates with native glass ones. They were soon being turned out by the thousands, having caught the public fancy to a marked degree. The custom of drinking tea from the saucer lasted in the United States for more than thirty years; and after its decline the convenient little plates were put to other uses—chiefly as individual butter-dishes.

The cup-plate should not be confused with either the honey-plate, the toddy-plate, or the tea-plate. The honey-dish does not have the flat-bottomed surface which is found in the true cup-plate; the toddy-plate

is larger, generally measuring from four and one quarter to four and three quarters inches in diameter; the tea-plate is still larger, being frequently found in six and seven inch sizes.

The most prolific makers of cup-plates were the Massachusetts and Pittsburgh flint-glass houses, although they were also made in smaller quantity at New York, Camden, Philadelphia, Wheeling, Steubenville, and other cities where the pressing-machine was operated.

Cup-plates are divided into two main groups: (1) those bearing historical or commemorative designs; and (2) those pressed in conventional and decorative patterns. The second group is by far the larger.

I doubt if satisfactory proof exists as to which particular factory first manufactured the cup-plate, although it is believed that some of the earliest historical or commemorative designs were produced at Sandwich.

While most of these plates were made of clear glass, nearly every color has been found in one or more of the various patterns. Many of the colored items are very rare, as, for instance, the cobalt-blue "Plow," the amethyst "Dahlia," the peacock-blue "Henry Clay," the amber "Stag," the grass-green "Butterfly."

While nearly all cup-plates have circular rims, at least four of the historical and several of the conventional designs are octagon-sided.

It is difficult to assemble a large collection of cup-plates every item of which is in "proof" condition, the finely serrated edges on many of the rims being prone to nick or chip. While a very small nick does not materially detract from the value of a cup-plate, one should never buy badly damaged examples; un-

less the design is of great rarity, the value of the damaged piece, from any standpoint, is next to nothing. The plates should never be placed one on top of another. The best method of cleansing them is with Ivory soap-suds and a soft brush. Black velvet makes an excellent background for the collection.

The prices asked for cup-plates increase steadily. As in the case of other forms of collector's glass, dealers' prices fluctuate temporarily, but they will never permanently recede. I remember a time when we could buy cup-plates of "mixed variety" for six and seven dollars a dozen, and "Jenny Lind" bottles for two dollars each. But that time is long past.

An early quotation on Sandwich cup-plates reads as follows: "132 No. 1 cup-plates, $7.92; 305 No. 2 cup-plates, $15.25; 77 No. 3 cup-plates, $2.98." Thus, something less than a century ago, the wholesale price of Sandwich cup-plates averaged around five cents apiece!

The steamer *Benjamin Franklin* was built for Captain E. S. Bunker and put into service September, 1828. She was 144 feet long, 21 feet in beam, 10 feet in depth of hold; equipped with two engines and rigged with three masts; and was the last word in ship-building in the twenties. It was said that "she sits upon the water like a swan." A writer of the day remarks that "the bar was in the forward cabin, so were generally the male passengers." This boat was "sumptuously furnished"; and a bust of Franklin decorated one end of the cabin, alongside those of "Fame" and the "Muse of History." She won renown in her race with the *Chancellor Livingston* in October, 1828, at Newport, Rhode Island. The "Benjamin Franklin" cup-plate

was probably struck off in commemoration of this event.

This Benjamin Franklin cup-plate is three and a half inches in diameter. The circular edge is serrated, and the stippled rim is impressed with scrolls, anchors, stars, and the American eagle. The ship faces left, the rigging is twisted, the waves short; she flies two flags and a pennant, one flag bearing the initials "B.F.," the other the stars and stripes. The initial "F" appears on the paddle-box. The name "Benjamin Franklin" is stamped above the ship.

The steamship *Chancellor Livingston* was of 496 tons burthen, her engines rated 75 horse-power, the paddle-wheels were 17 feet in diameter; two fly-wheels, each 14 feet in diameter, were connected by pinions to the crank-wheel, the machinery rising four feet above the main deck. She made six miles an hour against the tide!

Robert Livingston, after whom the boat was named, was Chancellor of the State of New York from 1777 to 1801 and a patron of Robert Fulton. Livingston, one of the five men who drafted the Constitution of the United States, was held in great esteem by his countrymen.

There are three varieties of the "Chancellor Livingston" cup-plate, each of which is three and one half inches in diameter; the circular edge is serrated, and the stippled rim is impressed with scrolls, hearts, stars, and shields. In one case, the ropes of the rigging are twisted and the waves are indicated by dots. In another, the ropes of the rigging are indicated by straight lines. In still another, the waves are indicated by lines instead of dots, while the hearts in the border are of

clear instead of stippled background. Different glass-works probably made these three variants.

As depicted upon two of our most famous cup-plates, the ship *Cadmus* is similar in line to the *Constitution*, but is shown in a smaller circle than the famous frigate. The *Cadmus*, a sailing-vessel built in 1816 by Thatcher Magoun of Medford, Massachusetts, was fitted out by a patriotic American merchant to bring Lafayette to this country in 1824. She reached our shores after a voyage of thirty-one days from France, and was escorted from Governor's Island to the Battery in New York by an imposing flotilla which included the *Chancellor Livingston*, the *Robert Fulton*, and other noted vessels. A water-color drawing of this little merchantman hangs in the Marine Museum at Salem, Massachusetts.

The "Cadmus" is probably one of our earliest cup-plates. It is three and a half inches in diameter; the circular edge consists of alternating scallops and points; the rim is stamped with scrolls, acanthus, and four stars; the border around the central circle, which measures less than one inch in diameter, is similar to the rim except for its inclusion of two shields. The tiny ship within the central circle is depicted under full sail. A variant of the "Cadmus" has one large and two small scallops alternating on the edge of the plate.

The "Maid of the Mist" cup-plate quite lacks the beauty of execution of the other "ship" plates. Perspective has taken a vacation, but not at Niagara Falls, for the Suspension Bridge, the falls, the sun, and the tiny *Maid* herself are quite awry. The little boat appears to run more danger from the scorching rays

of the huge sun than from the volume of water pouring over the falls. The *Maid of the Mist* was in operation several years prior to 1850; but as the plate depicts the second bridge, it was probably not pressed before 1855 or 1860. In fact, it was the last of the "historical" models.

The plate is three and one quarter inches in diameter; the circular edge is serrated, the rim has no stippling, and a circular and bull's-eye pattern is the only ornamentation. One known variant is a trifle larger, measuring three and a half inches in diameter; the water is less choppy-looking, the sun is surrounded by thirteen stars, and the abutments of the bridge differ from those in the commoner design. This plate was doubtless made by a small mid-Western house.

The frigate *Constitution*, vanquisher of the *Guerrière* in the War of 1812, was built in 1797 at the Boston Navy Yards and commanded by Captain Isaac Hull, who in 1813 presented the model of his famous ship to the East India Marine Society Museum at Salem, Massachusetts. During the public agitation which followed the announcement by our Secretary of the Navy in 1830 that the frigate was to be demolished, Oliver Wendell Holmes wrote his now famous poem "Old Ironsides," and the Sandwich glass-works designed and put on sale a "Constitution" cup-plate which undoubtedly helped to save the famous frigate from being destroyed.

The "Constitution" cup-plate measures three and a half inches in diameter, and the rim and edge are octagonal in shape. (There are four "historical octagons" in the American cup-plate list—the "Constitution," the "Robert Fulton," the "George Washington," and

the "Motto." Each is a rarity.) The edge of the "Constitution" plate is serrated, the narrow outer rim being of clear glass decorated with conventionalized motifs and stars; the border is stippled, with similar motifs imprinted upon it. The ship itself is better designed than in any of the other "ship" plates, with the possible exception of the "Cadmus." Like the octagonal "Washington," it is one of the most desirable pieces of true Americana which the glass-collector or museum may own. Among the rare variants is a *circular*-rimmed "Constitution."

The Robert Fulton cup-plate is sometimes called the "Fulton," sometimes the "Clermont." It is believed that the ship which it depicts is intended for the *Fulton*, although the question has never been definitely settled. The *Fulton* was built to be sent abroad, but due to the War of 1812 she was converted for the Hudson River passenger service.

This three and a half inch plate is a companion in form and general make-up to the "Constitution" plate. It is octagonal, with serrated edge, but the border of the plate contains four shields which the other plate lacks. The boat, steaming to the left, with a star embellishing the paddle-box, is not an exact representation of the *Fulton*, but it is very similar to contemporary woodcuts in the steamship company's advertisements.

Among rarities in cup-plates are the *circular* "Fultons" with bull's-eye edge, one of which is illustrated in this volume. I believe it was made by the Fort Pitt Glass Co. of Pittsburgh.

The "Little Fulton," or "Monmouth," is a three and a half inch plate. The very small steamboat in a circle

in the center is surrounded by a grape-vine motif and what is known as a "Tongs" border. The plate is generally supposed to be of Eastern origin, and to depict the *Fulton*. But there is reason to believe that it was made at one of the Pittsburgh factories, to commemorate the disaster of the *Monmouth*, a Mississippi River "side-wheeler" which broke in two after colliding with the *Trenton* on October 31, 1837, resulting in the loss of more than half of the six hundred Creek Indians who were on board.

The "Motto" is probably the last of our octagonal cup-plates of a historical or commemorative nature. It is also the only one which is stamped with the name of its maker—"Union Glass Works, Pittsburgh 1836." After considerable research upon the subject, I have concluded that the plate was made by McCully & Hay in 1836 to commemorate an Ohio River steamboat disaster of August, 1836. The *Motto*, on her maiden trip from the docks at Louisville to her destination at Pittsburgh, ran afoul of the shoals at the end of Blennerhassett's Island, and when she tried to release herself under heavy steam the boiler exploded, scalding eleven of the crew and passengers to death. Such cup-plates, before the day of Currier & Ives lithographs and our later illustrated weeklies, served as gruesome mementos of these tragic events.

This plate is also three and a half inches in diameter, is octagonal in shape, and bears eight large and eight small conventionalized motifs on its clear-glass border. The boat itself is shown in the process of sinking.

The most desirable of American "portrait" cup-

plates is the octagonal "George Washington." It is generally considered superior to all other of our plates in composition, design, rarity, subject, and metal. A large bust of Washington faces left, the profile being very distinct; rays emanate from all sides of the bust, and a laurel wreath encircles the border; the rim is of conventionalized scroll-and-star arrangement. The plate measures three and a half inches in diameter, and bears no lettering.

Major Ringgold, the hero of Palo Alto, is depicted upon a cup-plate struck off in 1846. His name is impressed on one side of the portrait. There are two variants of this subject. Major William Henry Harrison was imprinted on several varieties of three and a half inch plates, some of which bear his name and the line "Born Feb. 9, 1773," while others do not. Henry Clay was a favorite subject during his candidacy for President in 1847, nearly all of the leading glass-houses getting out cup-plates in an effort to promote his campaign. These may be found in several beautiful shades of blue, as well as in clear glass. There are several variants of the Bunker Hill Monument cup-plate.

The "Plow," the "Anchor," the "Hound" or "Stag," the "Bee-Hive," the "Lyre," the "Harp," the "Thistle," the "Butterfly" and other miscellaneous subjects attract the interest of the cup-plate collector. The "Log-Cabins" and the "Eagles" are the most diversified. The "Log-Cabins" were struck off at the time of William Henry Harrison's candidacy for President, the Whig party using as campaign emblems the cabin, the cider-barrel, and other objects associated with the career of the valiant hero of the War of 1812

and the Siege of Fort Meigs. We lack space to describe all the variants of these designs. Briefly, the ones more generally found are as follows:

1 Log Cabin with flag, hard-cider barrel, and tree.
2 Log Cabin with outer chimney and flag. Plain rim.
3 Log Cabin with outer chimney and flag. Acorn rim.
4 Log Cabin with top of chimney and flag.
5 Log Cabin with flag. Three inches in diameter.
6 Log Cabin with full view of chimney and cider-barrel.
7 Log Cabin, liberty cap, tree and foliage. Plain rim.
8 Log Cabin, liberty cap, tree and foliage. Acorn rim.
9 Fort Meigs, Log Cabin. Upper part stamped "Tippecanoe," lower part stamped " Wm. H. Harrison."

The "Eagles" are found in greatest variety. Nineteen of them are briefly listed below, but there are others.

1 The thirteen-star Eagle.
2 The eighteen-star Eagle.
3 The Star and Rayed Eagle.
4 The 1831 Eagle.
5 Bull's-eye-edged Eagle surrounded by Stars.
6 Same as No. 5 except conventionalized border is stamped on under side of rim.
7 The Pittsburgh Eagle.
8 The Coin Eagle.
9 The Fort Pitt Eagle.
10 The Plain Eagle.
11 The Grape-vine Eagle.
12 The Fleur-de-lis Eagle.
13 The Leaf-and-Flower Eagle.
14 The Concentrical Eagle.
15 The Plain-rimmed Eagle.
16 The Bull's-eye Star Eagle.

17 Same as No. 16 except bull's-eyes on edge are closer together.
18 Same as No. 16 except no bull's-eyes on edge.
19 The Plain-rimmed Eagle surrounded by thirteen Stars.

CHAPTER LIII

SOME NOTES ON BOTTLES

Glass bottles were first used by the ancients, but only to a limited extent. While the first strictly commercial use of glass containers must be credited to the Venetians, France was the first to bring the bottle into general use.

Two qualities are essential in a good bottle—strength, and power to resist corrosion. The scarred base, where the pontil has been broken off, is a characteristic of all bottles made before the 1850-60 period, when the "snap-case" began gradually to come into use. America is said to have always been the most wasteful country in the world in the matter of discarding empty bottles; which accounts in part for the enormous production of our bottle-houses from 1730 to 1870.

There are many kinds of bottles, and many subvarieties of each kind. The main divisions, in respect to the contents for which they were intended, are as containers for the following:

spirituous liquors
wines
snuff
ink
shoe-blacking
unguents and perfumes
apothecary and chemical supplies

patent medicines
capers and pepper-sauce
pickles
oils, especially castor-oil

We have never been a particularly abstemious people, and a greater artistic and commercial energy was spent upon the color, form, and design of the whisky-flask than upon any other kind of American-made bottle. The idea of our pictorial flask was derived from the English custom of modeling a mask, bust, conventionalized design, or scene upon pottery.

The vast amount of wine and spirituous liquors consumed in the Province of Pennsylvania alone within twenty-five years after the arrival of William Penn may be realized by a glance at the import statistics. In the first ten months of 1711 more than 68,000 gallons of wine and 383,000 gallons of rum entered the port of Philadelphia. There was an abundance of fine apple orchards in Massachusetts, Pennsylvania, New Jersey, and other provinces, and very good cider was pressed and sold for ten or fifteen shillings a barrel. In Pennsylvania, New Jersey, and Maryland excellent peach brandy was made and bottled. Oporto and Malaga grapes were brought to the colonies about 1750 by Abraham DeLeon, a Portuguese Jew who was a "free-holder" in Savannah, Georgia, where he first cultivated these varieties in his wonderful gardens. Pale ale and porter are said to have been first made in America in 1774; and in 1750 the brewing of barley into malt, and the malt into beer, for export purposes, is chronicled. In 1786, Lancaster County, Pennsylvania, had three breweries which were making beer for the foreign trade.

Distilleries and breweries sprang up everywhere in the newly opened Western country, shortly after the close of the Revolution, and a great number of bottle-glass houses almost immediately followed in their wake along the Monongahela, Ohio, and other mid-Western rivers. Corn grew so abundantly in this virgin soil that the pioneers were confronted with the alternatives of letting it rot or converting it into whisky. It was usually converted.

A century ago nearly all Americans drank, and in addition to the domestic trade great cargoes of whisky-containers were shipped down the Mississippi to the Louisiana territory and reloaded for foreign ports. Full-rigged ships were built and loaded at Brownsville or Pittsburgh, fully five hundred miles from salt water, and despatched down the Father of Waters, the trip to New Orleans taking about fifty-four days. The *Vesuvius*, the *Enterprise*, the *Washington*, and other vessels carried cargoes of glass to the rest of the world during the earlier days of navigation; and in later years the *Robert E. Lee*, the *Natchez*, the *Eclipse*, the *Grand Turk*, the *City of Cairo*, and other two-funneled "floating palaces" continued the work. Donald McKay's speedy clipper-ships conveyed liquor and liquor-flasks around the Horn in the days of the California gold rush; and when the flannel-shirted "forty-niner" from the East took passage on the *Sea Witch*, the *Flying Cloud*, or the *Shooting Star*, he took his whisky-bottle with him. Thus, as I have emphasized before in this volume, an American-made bottle or flask may logically turn up in almost any part of the world.

The following alphabetically arranged list will be of use to the collector in identifying those pieces of

American glass which are stamped with one or several initials—usually those of the maker's name or names, but sometimes that of the town in which the piece was made. Probably several of the initials which have not yet been identified are those of wholesale whisky-houses, which after 1864 often had the containers used for their goods stamped in this way.

A.	Adams & Co.	Pittsburgh
A. & Co.	Agnew & Co.	Pittsburgh
A. & D. H. C.	A. & D. H. Chambers	Pittsburgh
A. L. D. H. C.	A misprint for the above	Pittsburgh
A. G. Co.	Arsenal Glass Company	Pittsburgh
A. R. S.	A. R. Samuels	Philadelphia
B. K.	Benedict Kimber	Monongahela District
B. & S.	Boston & Sandwich; or Beatty & Stillman of Steubenville, Ohio	
B. & W.	Bryce & Walker	Pittsburgh
B. W. & Co.	Belzhover, Wendt & Co.	Pittsburgh
C.	Probably Cunningham	Pittsburgh
C. & Co.	Cunningham & Co.	Pittsburgh
C. G. Co.	Unknown	
C. & H.	Coffin & Hay	Hammonton
C. & I.	Cunningham & Ihmsen	Pittsburgh
C. R.	Curling, Robertson	Pittsburgh
C. & S.	Unknown (probably late)	
E. W. & Co.	E. Wormser & Co.	Pittsburgh
F. A. & Co.	Fahnstock, Albree & Co.	Pittsburgh
F. C. C. & Co.	Unknown (probably late)	
F. L.	Frederick Lorenz	Pittsburgh
F. L. & Co.	Frederick Lorenz & Co.	Pittsburgh
G.	Attributed to Salisbury, Vermont	
G. & H.	Gray & Hemingray	Cincinnati
G. W. R.	George W. Robinson	Mid-West
H. & Co.	Hancock & Co.	Findlay, Ohio
H. S.	Henry Schoolcraft	
H. & S.	Haught & Schwerer	Brownsville, Pa.
I. P.	Justus Perry (the "I" is meant for "J")	Keene
J. K. B.	Unknown	
J. R.	John Robinson	Pittsburgh
J. R. & Son	James Rowland & Sons	Pittsburgh
J. P. F.	Joseph P. Foster	Stoddard
J. T. & Co.	James Taylor & Co.	Monongahela River House

K. & M.	Knox & McKee	Wheeling
L. C. & R. Co.	Unknown	
L. F. & Co.	Unknown	
L. & W.	Lorenz & Wightman	Pittsburgh
Mc & Co.	McCully & Co.	Pittsburgh
N. E. G. Co.	New England Glass Co.	Cambridge
N. G. Co.	Northwood Glass Co. (?)	East Wheeling
P. A. & Co.	Unknown (probably a misprint for F. A. & Co.)	
R. K.	Richard Knowles (The Union Glass Co.)	Wheeling
T. S.	Thomas Stebbins	Coventry, Conn.
T. W. D.	Thomas W. Dyott	Philadelphia
W. F. & Sons	William Frank & Sons	Pittsburgh

Writing at the close of the nineteenth century, Dr. Edwin AtLee Barber, in his "American Glassware" (1900), classified the bottles and flasks then known into six types. There are now at least fourteen types, although they have never been classified in printed form. In 1900 only eighty-odd flasks had been listed, whereas to-day the number runs to several thousand. Dr. Barber recorded only twenty-nine "Eagles," nineteen "George Washingtons," and thirteen "Zachary Taylors." Scarcely a collector of that time (there were not many) had ever seen a mid-Western bottle or flask. This Western section has furnished at least four additional types. Between 1922 and 1925 a new variety of bottle turned up on an average of every two weeks. Now, only ten or twelve "previously unknown" specimens are found in a year.

The following is the approximate number of known varieties of some of our most familiar flasks:

45 Masonic Emblems
49 George Washington
13 General Lafayette
20 Trees

12 Ships
30 Cornucopia
12 Railroad
31 Pike's Peak
10 Cannon
7 Hunter
190 Eagle
28 Union and Clasped Hands

The following is a partial list of the "Washington" marks found on flasks:

George Washington. The Father of His Country
George Washington
General Washington
General George Washington
Gen. George Washington
Gen. Geo. Washington
G. George Washington
G. Geo. Washington
G. G. Washington
G. Washington

The following names or initials have been found on the "Scroll" or "Violin" types of flask:

B. P. & B.	(Pennsylvania)
J. R. & S.	(Pennsylvania)
J. R. & Son	(Pennsylvania)
McCarty & Torreyson	(West Virginia)
Lancaster Glass Works	(New York)
Louisville Ky. Glass Works	(Kentucky)
Rough and Ready	
"C"	(Ohio-Pennsylvania)
S. M'Kee	(Pennsylvania)
"A"	(Pennsylvania)
R. Knowles	(West Virginia-Ohio)

It will be noticed that five States are represented by these marked examples.

The "Anchor and Rope" motif was stamped by at least the following houses:

Baltimore Glass Works
Spring Garden
Ravenna Glass Works
Lockport
New London
Isabella
Richmond
"A G CO."

The "Union and Clasped Hands" is found stamped with the following initials or names:

A. & CO.
A. R. S.
A & D. H. C.
C. & I.
C. I. & Sons
Cunninghams & Co.
E. Wormser & Co.
F. & A.
F. L. & Co.
G. A. Berry & Co.
George A. Berry & Co.
H. & S.
L. & W.
Mc. & Co.
W. Frank & Sons
W. F. & Sons

Some of the rare colors in otherwise more or less common flasks are the following:

Amber "Kossuth"—Kensington
Amber and ultramarine blue "Jenny Lind."
Amethyst "Jenny Lind"—Fislerville
Claret "Baltimore Monument"—Baltimore
Cobalt "Masonic"—Zanesville
Cobalt "Columbia"—Kensington
Amber and blue "Corn for the World"—Baltimore
Rose, purple, and opalescent 'Scroll" or "Violin"

Rose and puce "Washington and Taylor"
Cobalt marked "Cornucopia"—Lancaster
Citron marked "Union and Clasped Hands"—E. Wormser
Claret "Sunburst"
Amethyst half-gallon Louisville "Scroll," or "Violin"
Grass-green "Indian Queen"
Grass-green "Booz" bottle
Puce "Major Ringgold"—Baltimore
Grass-green "Success to the Railroad"
Claret "Sheaf of grain, Large tree" calabash—Sheets & Duffy

The dates when certain historical and pictorial flasks appeared are approximately as follows:

Sunburst	1810–15
Masonic	1815–20
George Washington	1820–25
John Adams	1820–25
Marquis de Lafayette	1825–26
Governor De Witt Clinton	1825–26
"Success To The Railroad"	1832–38
Benjamin Franklin	1830–40
Zachary Taylor	1837–40
Braxton Bragg	1837–40
Major Ringgold	1837–40
Andrew Jackson	1837–40
William Henry Harrison	1840–46
"Resurgam-Phœnix"	1850–51
Louis Kossuth	1851–53
Jenny Lind	1851–53
"Union and Clasped Hands"	1864–70
Ballet Dancer	1865–70
"Not For Joe"	1870–75
Pike's Peak	1870–80

The "Calabash" bottle, so named from its resemblance in shape to a calabash or gourd, usually holds one quart or a trifle more. This bottle is almost spherical in form, with a long sloping neck, which may be rimmed, rolled, slightly or deeply collared. Although generally found in aquamarine, these interesting containers have been discovered in nearly every shade of green and blue, in light and dark amber, in puce, claret, and amethyst. These bottles, made in the period when the "snap-case" went into effect, may be found with a very deep and rough pontil mark, or with the smooth base. A list of "Calabash" types follows:

1 Obverse: Head of Kossuth, facing right, "Kossuth" above head. Reverse: Tree in leaf. (Made by S. Huffsey.)

2 Obverse: Head of Kossuth, facing right, "Kossuth" above head. Reverse: Bust of Jenny Lind, facing left, surrounded by laurel wreath, "Jenny Lind" below bust.

3 Obverse: Bust of Kossuth facing left, wearing high hat with plume, flag on each side of bust, "Louis Kossuth" above bust. Reverse: Ship, "U.S. Steam Frigate Mississippi" below ship. Stamped on base of bottle, "Ph. [Philip] Doflein Mould maker Nth 5th St. 84" [Philadelphia]. (Made by S. Huffsey.)

4 Obverse: Bust of Jenny Lind, facing left, wreath encircling bust, "Jenny Lind" above bust. Reverse: Picture of glass-works, "Glass Works" above picture, "S. Huffsey" below picture. (Made by S. Huffsey.)

5 Obverse: Bust of Jenny Lind, facing left, wreath underneath bust, "Jenny Lind" above bust. Reverse: Picture of glass-works, "Fislerville Glass Works" above picture.

6 Obverse: Bust of Jenny Lind, facing left, wreath encircling bust, "Jenny Lind" above bust. Reverse: Picture of glass-works, "Milfora G. Works" above picture. (Made in New Jersey.)

7 Obverse: Bust of Jenny Lind, facing left, wreath encircling bust, "Jenny Lind" above bust. Reverse: Picture of

glass-works, "Glass Factory" above picture, six-pointed star between words "Glass" and "Factory." (Made by Whitney.)

8 Obverse: Bust of Jenny Lind, facing left, wreath encircling bust, "Jeny [sic] Lind" above bust. Reverse: Picture of glass-works, no inscription. (Made at Ravenna.) (Also made by Whitney.)

9 Obverse: Bust of Jenny Lind, facing left, smaller and narrower bust, "Jenny Lind" above bust, wreath encircling bust but smaller and not so well executed as in the other molds. Reverse: Picture of glass-works, no inscription. (Accredited by Van Rensselaer to Union Glass Works, Philadelphia.)

10 Obverse: Bust of Washington, facing front. Reverse: Tree in leaf. (Made by Sheets & Duffy.)

11 Obverse: Small bust of Washington with queue, facing left. Reverse: Tree in leaf.

12 Obverse: Hunter, facing left, shooting at two birds in flight, also two dogs. Reverse: Fisherman holding fish, mill to left. (Made by Whitney.)

13 Obverse: Hunter, facing left, shooting at two birds in flight, one dog. Reverse: Fisherman, facing right, mill and large tree.

14 Obverse: Hunter, with lower aim than on other bottles. Reverse: Fisherman, facing left, drawing in fish on hook. No mill or tree.

15 Obverse: Sheaf of grain with crossed rake and pitch-fork underneath sheaf. Reverse: Large tree in leaf. (Made by Sheets & Duffy.)

16 Obverse: Sheaf of grain, more slender than on No. 15, pitch-fork and rake underneath. Reverse: Smaller tree in leaf, bird perched on top.

17 Obverse: Sheaf of grain, clasped hands and union, branch each side of emblems, thirteen stars in semi-circle above emblems. Reverse: Eagle, ribband in beak, facing right. (Made at Ravenna.)

18 Obverse: Sheaf of grain, "Sheets & Duffy" above grain, pitch-fork and rake underneath, spear of grain on each side above sheaf. Reverse: Eight-pointed star.

19 Same as No. 18, except "Sheets & Duffy" omitted.

20 Same as No. 19, except bottle has looped handle.

21 Obverse: Sheaf of grain, pitch-fork and rake underneath. Reverse: Eight-pointed star. Looped handle. (Made at Ravenna.)

22 Obverse: Figure of soldier with musket. Reverse: Large eleven-pointed star.

23 Obverse: Eagle with ribband in beak, facing right, eagle perched on shield, arrows and olive-branch extending from shield. Reverse: Plain. (Made by A. R. Samuels.)

24 Obverse: Very similar to No. 23 except "A. R. S." below design. Reverse: Union and clasped hands, thirteen stars in semi-circle above design, Masonic emblems below. (Made by A. R. Samuels.)

25 Obverse: Similar to No. 23. Reverse: Similar to No. 24, except Masonic emblems are replaced by vertical ribbing, and word "Union" is larger.

26 Obverse: Sheaf of grain, crossed rake and fork. Reverse: Anchor and rope, "Baltimore" on ribband above anchor, "Glass Works" below. (Made by Baltimore Glass Works.)

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GLOSSARY

Glass-House Terms

BATCH: the mixture of raw ingredients or materials.

BLOWING-IRON (or blowpipe): a hollow tube, usually about four feet long.

CAULKER: the oven in which the sand is burnt (calcaria-lime kiln).

CHARGE: to feed the raw ingredients into the pot.

CORDS: stringy imperfections on the surface of glass.

CULLET: particles of broken or refuse glass with which the batch in the pots is replenished.

EYE: the center of the grate—the hottest part of the furnace.

GADGET: a spring-clip attached to the pontil to hold the foot of a wine-glass or similar object while the bowl is being finished, to prevent a pontil mark.

GAFFER: the foreman of a gang or crew; the superintendent.

JOCKEY: a small pot which in the furnace can ride or rest on the top of a larger one.

LEHR (or LEER): annealing-furnace or oven for the glass.

MARVER (Fr. *marbre*): a slab of iron on which the glass is rolled to smooth the outside of the mass before the blowing.

METAL: the substance of glass; the material in a state of fusion.

NATRON: native sesquicarbonate of soda. (Sidon.)

PARISON: a gathering of liquid glass.

PONTIL (puntee, ponty): a solid iron rod with which to hold the object being blown. It is attached directly opposite the blowpipe.

POTSHERDS: pieces of old broken pots, picked clean, which are used with the pot clays to form the mass, tending to give it strength.

PUCELLAS: spring-tools with dull wooden blades, used in shaping the blown glass.

PUGGING: working the clayey mass.

RIPEN: to prepare for use. (Pot clays are put out to putrefy or disintegrate prior to the fashioning of the pots.)

SANDIVER (Fr. *suint de verre*): grease of glass scum which rises on the top of melted glass; sometimes called salts.

SHEARERS: furnace-tenders. (Shearing: tending the furnace.)

SHOP: a glass-house crew.

SKETTLE: a small pot for melting enamel or colors.

SPRING-TOOT: simple tongs.

TAKER-IN: the boy who carries the finished glass from the gaffer to the lehr.

TEASER or TEAZER: the stoker.

TENSE-HOLE: (IT. *tizzonaio*) the fire-box of the furnace; the stoke-hole.

TRIGGER or FRIGGER: a test piece.

ZAFFRE (Arab. *Zaffer*): impure oxide of cobalt used in making cobalt blue.

Terms Relating to Glass Ornamentation

BALLUSTER: a stem of glass having an outline similar to a baluster of wood or marble.

BIFURCATED MOUTH: a mouth divided into two branches or parts—forked.

BLAZES: upright or slanting lines, very useful in aiding refraction. (A term usually employed in connection with glass-cutting.)

Glossary

BLOBS, prunts, seals, mascaroons, etc.: small lumps of molten glass applied as a decoration to the surface of the blown glass.

BLOWS: tears in the stem of a wine-glass which are round in shape.

FLANGED LIPS: a projecting flat rim or collar.

GADROONS: convex curves in a series forming an ornamental edge like inverted fluting.

GIMMAL-FLASK: a flask or bottle containing two separate compartments, each with a spout. (Generally used as a container for oil and vinegar.)

IMBRICATIONS: leaves or scales arranged so that they overlap like tiles on a roof.

MERESE: the sharp-edged button between the bowl and the leg of a glass, or the connecting section of a stem.

PRINTIES: the glass-house term for thumb-print patterns.

RUMMER: a large glass on a foot without a stem, popular at the end of the eighteenth and the beginning of the nineteenth century.

SPLITS: small angular grooves placed in the angles of other cuttings. (A term used in cutting glass.)

STELLATED: arranged like a star radiating.

SYLLABUB: a small glass used in the serving of syllabub, a concoction of which fresh milk is the main ingredient.

TEARS: bubbles of air imprisoned in glass.

WRITHEN ORNAMENTATION: ornamentation consisting of perpendicular ribs impressed on the soft glass in the course of making. (These are frequently twisted so that they run diagonally. The twist is generally from left to right.)

INDEX

"A," 443
A. & Co., 444
A. & D. H. C., 444
"Acanthus" design, 326
Acid, Hydrofluoric, 5
Acorn, 285
Adams, A. A., 345
Adams, Dr., 421; offers to workmen, 422
Adams, Charles, 354
Adams, John, 103, 173, 345; interest in American Glass-making, 176
Adams, John Quincy, 258
Adams, Macklin & Co., 345
Adams, William, 186, 345
Adams & Co., 441; beginnings, 345; distribution, 346; export, 346; output, 346
Adams Company, 189
Adams, Mass., 189
Africa, 17
Agate, 4
"A. G. Co.," 444
Agnew, John, 348
Agnew & Co., 348, 441
Alabama, Miss., 257
Albany, N. Y., Glass Works, 165 *et seq.;* development, 167; few records, 165; Hamilton community, 166; output, 167; State aid, 165, 167; varied owners, 165 *et seq.*
Allegheny river, 349
Allen, Col. John, 202
Aleppo, Syria, 14
Alexandria, Egypt, 13, 14
Alexandria, N. Y., 235
Alexandria, Va., 176
Alford, Colonel, 88 *et seq.*
Alligré, Sophia, 203
Alliquippa's Island, 336
Almería, Spain, 16
Altare, Italy, 17
Alumina, 7
Amelung, Frederick M., 297
Amelung, John Frederick, 149, 172 *et seq.*, 206, 324, 402, 414; death, 297; difficulties, 174; English animosity, 174; expenditure, 174; Federal Government, and, 175; financial difficulties, 175; German Glassmaker, 142, 172; tract on glassmaking factories, 172
Amelung & Co., Frederick M., 297
Amelung's Glass Works, 172
America, 75
American Architecture, 80; arts and crafts developed, 79; breweries, 439 *et seq.;* business depression, 126; colonial wars, 79; distilleries, 440; furniture, 80; glass imported, 80; Holland treaty, 164; import duties, 81; industrial conditions, 80, 88; liquor consumed, 439 *et seq.;* taxes a burden, 126; (*see also* United States)
American Apollo, 165
American Banner, 351
American Flint Glass Association, 333
American Flint Glass Factory, 130
American Glass, 337; Amelung specimens, 176, 177; authenticated specimens, 187 *et seq.*, 252; authentication of specimens, 36 *et seq.*, 170; Bayard-Bamper,

American Glass—*Continued*
114 *et seq.;* blown (*see* separate item); boat furnishings, 415, 429; changes in type, 261; characteristics, 36 *et seq.;* Christmas-tree ornaments, 140, 363; dating difficulty, 39; dealers, 38; decadence of design, 262, 270; demand for utilities, 326; demands for, 260; distribution, 123, 250; early production, 80, 95; era of bad taste, 296, 415; European influence, 96, 136, 266; exported, 55, 70, 346, 386; first makers, 95; first Virginia, 54; flower designs, 269; Gabler specimens, 170; grades, 191; Greensboro, 206; Hewes specimens, 163; hollow-ware, 184 *et seq.*, 188, 204; identification, 39, 70, 95, 114, 141, 195, 207, 217, 269, 292, 295, 322, 327; identification marks, 267, 441 *et seq.;* influences on, 18; iridescent, 30; Jacony baskets, 217; Keene flask designs, 247 *et seq.;* Kensington (*see* separate item); Kramer family, 206; "lace," 292; lamps (*see* separate item); lights, 140; makers' marks rare, 271; manufacture (*see* separate item); medals awarded to, 332; milk-pans, 48 *et seq.;* misconceptions regarding early, 95; nineteenth century styles, 261; ornaments, 419; output of early, 378, 382; pressed glass produced, 265 *et seq.;* prices of early, 195, 214, 314; rare specimens, 234, 235; resonance, 40; sale of early, 110; Salisbury specimens, 237; South Jersey (*see* separate item); Spanish influence, 16; specialties, 349 *et seq.*, 353; stamp marks, 441; Stiegel (*see* separate item); taste in, 390; tests, 39 *et seq.;* Utica specimens, 233; Venetian influence, 16; window-panes, 48; (*see also* South Jersey Stiegel *and* Wistarberg glass)
American Glass Manufactory, 172
American Glassware, Dr. Edwin AtLee Barber, 442
Amethyst, 4
Ammonia, 8
Amshurst (Anshurtz), Jacob, 298
Amsterdam, Fort, 67
"Anchor" design, 341, 435
"Anchor and Rope," design, 444
"Andrew-Jackson," design, 1837-40, 445
Annals of Albany, Munsell, 167
Antiques, 30, 36, 316, 327, 328
Antwerp, 265
Appleton, Aaron, 242, 244
Arbogast, Philip, 347, 400
Arbogast & Kaplahn, 350
Architecture, American, 80; glass used in, 15
Artic, 250
Argall, Captain, 56
Argus, Albany, 169
Arland, Louis, 361
Arratt (glass-blower), 287
A. R. S., 444
Arsenal Glass Co., 198, 441
Arsenic, 8
Atlantic Glass Works, 356
Atterbury, Challoner & Hogan, 347
Austria, 35
Ayars, John E., 358
Ayres, Joseph, 361

Backus & Fenn, 232
Bacon, Edward, 364
Badger, A. M., 34
Baker & Brothers, H. J., 300
Baker Brothers & Co., 300; acquire Spring Garden, 304; begin bottle-making, 302; purchase Federal Hill Works, 302

Index

Bakewell, Benjamin, 314, 315
Bakewell, Benjamin, Jr., 315
Bakewell, John, 315
Bakewell, Mary E., 312
Bakewell, Thomas, 307, 315; disapproved of apprenticeship, 325
Bakewell glass, identification difficult, 269
Bakewell, Page and Bakewell, 33, 34, 95, 257, 307 *et seq.*, 325, 338, 341, capacity, 312; chandeliers, 316; change in name, 315; community interests, 313; cut glass, 315; diversified output, 313, 315; early output, 315; Federal investigation, 314; first successful flint-glass house, 311; Franklin Institute medal, 312; furnace capacity, 307; gift to Lafayette, 312; identification difficult, 316; labor shortage, 308; last of line, 315; methods used, 316; noted visitors, 308 *et seq.*, period of existence, 315; place in industry, 316; quality, 308; reputation, 308, 314, 316; Sandwich, 316; tableware, 313; transportation problems, 308; wares advertised, 309; White House order, 310
Bakewell, Pears & Co., Ltd., 315
Bales, Mary, 163
"Ballet Dancer" design, 445
Baltemar, Christopher, 166
Baltimore Glass Works, 444; colors produced, 304, 305; flask types, 304
Baltimore, Md., 198, 207; fire loss, 300, 306; first factory, 297; glass works, 297 *et seq.*
"Baltimore Monument" design, 444
Bamford, John, 363
Bamper, Lodewÿck, 50, 95, 108, 112; business interests, 117; disposal of organ, 116; estate, 116; few specimens, 117; household furnishings, 115; marriage, 114; New York residence, 116; removal of family to New York, 115; servants and crew, 115; (*see also* Bayard-Bamper)
"Banker's Ink-wells," 369
Batoto, N. J., 355
Barber, Dr. Edwin At Lee, 24, 33, 62, 442
Barber, E. O., 238
Barcelona, Spain, 16
Bar goods, 398 *et seq.*
Barnes, James, 394
Barnes, James B., 279
Barnes, James F., 395, 396
Barnes, Hobbs & Co., 396
Barrett, Charles B., 367
Bartram, Alexander, agent, 130
Baruch, glass-maker, 370
Barytes, 333, 334; characteristics, 269; value in glass-making, 268, 279; where found, 269
Batty, William, 198
Bavaria, 80, 179
Bavarian glass, 141; enameling, 138
Bayard, Samuel, 108, 112
Bayard & Co., Samuel, 112
Bayard-Bamper, import and export business, 114; retail shop, 114; (*see also* Glass House Company of New York)
Bayot & Cummings, 423
Beads, American, 59 *et seq.*; colors, 62, Indian trade, 57 *et seq.*; limited production, 59, 62; shapes, 62
Beasley, Morris, 362
Beatty, A. J., 386, 387
Beatty, Joseph, 386
Beatty & Stillman, 40, 269, 386, 441
Beaver Brook, N. H., 244
Beck, John, 228
Beck, Washington, 34 *et seq.*

Beckett, Benjamin, 364
Bedenburg, pot-maker, 415
"Bee-Hive" design, 435
Belcher, Governor, 88 *et seq.*
Belgium, 35, 39
Bell, Joseph, 398
Belle Vernon, Va., 253
"Bell-flower" design, 270, 326
Belvidere, N. J., 227
Belzhover, Wendt & Co., 441
Benezet, financier, 128, 131
Benjamin Franklin, 429
"Benjamin Franklin" design, 445
Berkshire Glass Co., 170
Berkshires, glass factories, 82
Bernardo, Venetian glass-blower, 60, 61
Bernard's Bay, N. Y., 412
Berovieros, 17
Berry, George A., 254
Berry & Co., George A., 34, 444
Bethlehem, Pa., 227
Betz, Martin, 124
Beverly, Mass., 64
Bibliography, 449 *et seq.*
Binney, Amos, 274
Birch, Thomas, 228
Birmingham, England, 280
Birmingham, Pa., 326, 337
Birmingham Flint Co., 341
Bishop, J. Leander, 76, 275
Bishop, Samuel, 192
Blackburn & Ulam, 350
Black Horse Tavern, 382
Blake, Jonathan, Jr., 188
Blankinsop, John, 403
Blankinsop, Peter, 403
Blennerhassett's island, 434
Bloodgood, Francis, 168
Bloomer, furnace-builder, 362
Blowers, itinerant, 39; work, 22; (*see also* Workmen)
Blown glass, 9; Bryce output, 326; bubble, 13; characteristics of old, 41; colored, 279; development, 13, 23; French, 17; hollow-ware, 337; method of production, 264; molds, 27; "offhand," 169, 170, 184, 189 *et seq.*, 197, 229, 232, 233, 238, 241, 251, 354; periods, 38; processes, 22 *et seq.*, 29; Sandwich quality, 292; specimens, 189, 362; tableware, 75, 169; tools, 22; Venetian diamond, 135; without mold, 136; workmen, 22 *et seq.*; (*see also* Insufflated glass)
Blowpipe, 22
Bobo & Abeitz, 350
Bodine, Francis I., 355
Bodine, Francis J., 355
Bodine, J. & F., 355
Bodine, J. Nixon, 355
Bodine, Joel, 354, 355, 359
Bodine, Joel A., 355
Bodine, Joel F., 359
Bodine, John (son of Joel), 359
Bodine, John F., 355, 359
Bodine, Samuel, 355
Bodine, William H., 355, 359
Bodine & Black, 359
Bodine & Co., Thomas, 359
Bodine & Sons, Joel, 355, 359; wares advertised 360
Bogardus, Pastor, 67
Bohemia, 126
Bohemian glass, 18; composition, 4; decoration, 316; drop in value, 266; imitated in America, 250, 288, 291, 316
Bonventuro, Venetian glass-blower, 60
Booz, E. C., 156
"Booz" design, colored, 445
Borden, Joseph, 355
Borken, North Brahant, 72
Boston, Mass., 9, 79; glass-works, 181 *et seq.*; Hancock Tavern, 368; newspapers, 6
Boston and Lowell Railway, 187
Boston and Sandwich Glass Co., 10, 34, 123, 141, 277, 282 *et seq.*,

Boston and Sandwich Glass Co.—*Continued*
313, 332, 338, 341, 349, 441; buildings, 283; capacity, 285, 288; export, 290; factory closed, 290; Fessenden management, 288, 294; first pressed-glass tumbler, 286; labor troubles, 289; list of products, 285; list of workmen, 287; model town, 284; number of employees, 294; organizers, 282; output, 290; period of existence, 290; raw materials secured, 284; Sandwich glass (*see* separate item) scope of output, 286; timberland owned, 283; wage scale, 287, 294; wares advertised, 286, 288; war production, 289
Boston and Sandwich Railroad, 285
Boston Commercial Gazette, 276
Boston Crown Glass Company, 182 *et seq.*; success, 168
Boston Crown Glass Factory, 243
"Boston" design, 328
Boston Gazette, 104
Boston Porcelain Glass Co., 274
Boston Porcelain Glass Manufacturing Co., 184
Boston Tea Party, 183
Bostwick, Charles, 373
Bottles, 85, 91, 113, 151, 154, 194, 214, 352, 377; Amelung, 178; black, 245, 249; blacking, 302; blown, 406; Brownsville designs, 251; bulbous, 232, 374; calabash, 157, 360, 365, 384, 403, 446; calabash types listed 446 *et seq.;* carboys (*see* separate item) chief Baltimore product, 304; colored, 135, 150, 199, 260, 358, 361, 370, 374, 376, 383, 419, 444; crude, 76, 90, 153, 199, 320, 393; cut glass, 339; "Daisy-in-the Square," 128; dated, 114, 229; demand for, 326, 390, 397; demand for liquor, 406, 439; demijohns, 50; designs and their variations, 34, 326, 343, 442 *et seq.;* double-dipped, 194; druggists', 145, 147, 149; Dutch, 66; English, 66; Erie canal, 187, 197; evolution, 42, 45; first amber, 350; first crude production, 49; first glass article, 45; flasks (*see* separate item); French, 438; furnace operation, 22; green, 190, 249, 300, 422; identification, 66; important product, 50, 80; imported, 80; ink, 201, 302; "Jenny Lind," 33; junk, 50, 141; Kensington, 150; Kimber specimen, 252; kinds, 33, 65, 141, 147, 150, 151, 200, 315, 345, 348; kinds listed, 438 *et seq.;* "Lafayette," 187; largest, 370; liquor, 50, 70, 80, 366, 379, 390, 416; Lowell railway, 186; mid-western types, 442; mineral water, 359, 368; molds, 33; mustard, 91, 141; necessary qualities of, 438; need for, 64; notes on 438 *et seq.;* nursing, 136; "offhand," 200; patent-medicine, 150, 156, 157, 302, 338, 345, 348, 350, 359, 366, 410; perfume, 123, 345, 348, 380; Perry, 246; pictorial, 96, 439; "Pike's Peak," 33; Pitkin quality, 193 *et seq.;* porter, 302, 337, 338, 359, 379; portrait, 148, 150, 197, 252, 258 *et seq.;* 317, 435; prices, 123; profits from, 105; "railroad," 248, 260; rare colors, 444; rare designs, 156; rare Lorenz, 317; sale, 109, 110; Salem, 66; Saratoga Springs specimens, 230; sizes, 110, 147, 200, 358, 374; smallest, 370; snuff, 91, 145; specimens, 37, 369; stamped, 150; stamp marks, 443 *et seq.;* Stiegel, 120,

Bottles—*Continued*
140, 383; swirled, 375, 383, 393, 404; types, 142, 326; Venetian, 438; vials, 149, 178; whiskey, 156; Whitney types, 156 *et seq.*; wicker casings for, 367; wine, 302, 338, 359, 416; Zanesville type, 374, 383; (*see also* Flasks *and* Blown glass)
Boudinot, member of Congress, 179
Bours, Peter, 233
Bowdle, Tristram, 356
Bowdoin, James, 102
Bowls, 24, 123, 200; molds for, 26
Boyer, Charles S., 152, 153, 226
B. P. & B., 443
Braddock, General, 259
Braddock's Trail, Pa., 258
Bradford, D., 242
Brady, Irish glass-maker, 403
Bragg, Captain, 304
Braintree-Quincy works, 103 *et seq.*
Brass molds, 26
"Braxton Bragg" design, 445
Breading, Mary, 250
Bremen, Germany, 265
Briati glass, 17
Brick, Joshua, 219, 221
Brickerville, Pa., 123
Bridgeport Glass Works, 252
Bridgeton (Bridgetown), N. J., 354
Breweries, 376, 439
Brockunier, Charles W., 396
Brooklyn, flint-glass, 4; glass-making, 70; glass works, 411 *et seq.*
Brooklyn Glass Factory, 357
Brooks, Nicholas, 128
Brooks & Sharp, 128
Brouwer, Margita, 114
Brown, Captain David, 187
Brown, Darius, 187
Brown, John, 187, 421
Brown, John T., 358
Brownsville, Pa., 258, 376, 389, 441; designs, 251; glass works, 249; various owners, 249 *et seq.*
Brunot, Dr., 312
Brussels, Belgium, 8
Brust, Adrian, runaway servant, 92
Bryce, James, apprenticeship, 325; coöperative company launched, 326; other interests, 325
Bryce & Walker, 441; Bryce Brothers, 325
Bryce, McKee & Co., 325, 326
Bryce, Richards & Co., 325
Bryce, Walker & Co., 325
Buchanan, A. W., 318
Buck, John P., 354
Buck & Co., E. A., 199
Buckingham, Ebenezer, 372
Budd, writer, 75
Buffalo, N. Y., 412
Bull, William G., 353
Bull's-eyes, 49, 70
Bulltown, N. J., 354
"Bunch of Grapes" design, 224
Bunker, Captain E. S., 429
Bunker, collector, 292
Bunker Hill Monument, 435
Bureau-knobs, 315, 346
Burgin, Wood & Pearsall, 221
Burke, Sedgwick & Co., 251
Burling Brothers, 356
Burlington, Vt., 238, 240, 371
Burns, Joseph, 373, 377
Bussolin, Italian glass-maker, 17
Butland, James, 145
Butland & Company, James, 145
"Butterfly" design, 428, 435
Buttons, 363
Buzzard's Bay, Mass., 283
Byzantium, 15

"C," 443 .
Cackler, real estate owner, 387
Cadalso, Spain, 16

Index

Cadiz, Spain, 16
Cadmus, 431 *et seq.*
Cadwalader, Rees, 372
Caines, Thomas, 185
Cains Point Glass Works, 300
Cairo, Egypt, 14
Calcutta, India, 313
Caldwell, James, 166
California, glass-making, 423
Cambridge Company, 217
Cambridge Glass Works, 40, 284, 294, 316; tableware, 260
Cambridge, Mass., 257, 374, 395, 397, 442
Camden, glass-maker, 142
Camden, N. J., 300, 363
Camden & Amboy Railroad, 305
Campbell, Edward, 249
Campbell, Henry, 341
Campbell, William R., 250
Campbell & Forsyth, 250
Campbell & Co., E., 250
Canada, 399
Canary islands, 63
C. & I., 444
Candlesticks, 328, 398; colored, 358; first, 48; Sandwich, 333
Canisters, 100; snuff, 37
Canton, Ohio, 252
Cape Ann, Mass., 202
Cape Cod Company, 296
Cape Cod, Mass., 267, 283
Cape May, N. J., 362
Capewell, Frederick, 363
Capewell, James, 363
Capewell, John, 363
Carbonic acid, 269
Carboys, 50, 150, 210, 222, 338, 368, 383, 406; Dilkin, 124; export, 193; specimen of amber, 239
Carkesse, Charles, 87
Carl, John, 401
Carl, Nathaniel, 401
Carlisle, Pa., 123, 323
Carl, Theodore of Bavaria, 84
Carothers, George, 389; lack of stamp mark, 390
Carpenter, Edward (son of Thomas), 154
Carpenter, Elisha, 200
Carpenter, Thomas, 153, 154, 406
Carpenter & Co., Edward, 154
Carroll, Miss A. E., 195
Carroll of Carrollton, Charles 173, 175, 176
Carter, John W., 377, 378
Carter & Hogg, 251
Carter & Woodruff, 378
Carthage, Ohio, 382
Carthaginians, 16
Casey, John, engraver, 137
Casseday & Hopkins, 416
Cassel, Joseph, 377
Cassell, William C., 377
Catanian Amber, 50
Caullman & Fegan, agents, 139
Central Glass Company, 399
Chain Stores, 250, 251, 290
Challoner & Taylor, 347
Chamberlin, R. B., 199
Chambers, Alexander, 342
Chambers, David H., 342
Chambers, James, 342
Chambers, A. & D. H., 441; colors produced, 343; flasks, 343; output, 343; stamp marks, 343
Chambers, A. & L. H., stamp marks, 337
Champlain Glass Works, 240
Chancellor Livingston, 429 *et seq.*
"Chancellor Livingston," cup-plate, 430
Chapman, John Lee, 305
Chapman, Jonathan, 306
Chapoul, bookkeeper, 287
Charles I of England, 45
Charles City, Va., 49, 58
Charleston, West Virginia, 79
Charlestown, Va. (*see* Wellsburg, W. Va.)
Chelmsford Glass Works, 369

Chelmsford, Mass., 185
Chemical Apparatus, 356
Cheshire Crown Glass Works, 187
Chester Creek Glass Works, 75
Chester Glass Co., 189
"Chestnut," design, 403
China, 17; glass-making, 13, 15; Han dynasty, 15; porcelain, 14
Chicago, Ill., manufacture in, 259; World's Fair, 140
Chillicothe, Ohio, 372
Chipman, George, 239
Christmas-tree ornaments, 363
"Chymical," glass (*see* Druggists' ware)
C. I. & Sons, 444
Cincinnati, Ohio, 8, 415, 441; glass houses, 379 *et seq.*
"Cincinnati," design, 328
City of Cairo, 440
Civil war, 8, 199, 201, 226, 262, 285, 289, 296, 343, 353, 367, 383, 396, 397, 423
Clark's Glass Works, 423
Clay, Henry, 395, 435
Clay, American, 19 *et seq.;* basis of soil, 3; cores, 26; Holland, 313; imported, 19, 313; Indian, 313; kinds, 19; Missouri, 8; pottery, 19; quality of Pennsylvania, 211; ripening, 211; Stourbridge, 89, 402
Clayton, N. J., 364
Clement, Samuel, 221
Clement's Glass Works, 221
Clementon, N. J., 225
Cleveland Glass Works, 410
Cleveland, N. Y., 410
Cleveland, Ohio, manufacture, 259
Clinton, DeWitt, 197, 231
Clyde Glass Works, 234
Clyde, N. Y., 233
Coal, as fuel, 6, 22, 285; abundance, 385; anthracite, 158; bituminous, 158; East unfamiliar with, 167; experiments in glass works, 303; first used in glass-making, 209; new use for, 356; price, 395; West Virginia, 274
Cobb, William, 188
Cochran, Walter, 166
Cochran's Glass Factory, 361
Coffin, Bodine, 223
Coffin, Edwin Winslow, 223, 357
Coffin, F. W., 383
Coffin, John Hammond, 362
Coffin, John Hammonton, 223
Coffin, William, 356, 362
Coffin, William, Jr., 221, 223, 356
Coffin & Co., William Jr., 356, 359
Coffin & Hay, 223, 441
Coffin & Pierce, 356
Coffin, Pearsall and Company, 222
Cohansey Glass Manufacturing Company, 355
Coleman, Anthony, 61
Coleman, Robert, 133
Collectors' hobbies, 425 *et seq.*
Collins, James, 191
Colony, Henry, 243
Colony, J. D., 243
Colony, Timothy, 243
Colored glass, 91, 120, 188, 190, 368; Baltimore, 304, 305; beads, 62; bottles, 230, 260, 358, 361, 370, 376, 410; bureau-knobs, 316; church windows, 74; color combinations, 141; colors produced, 70, 135, 150, 195, 198, 200, 201, 206, 234, 247, 260, 361, 384, 408, 419; Conventry, 197; demand for, 390; flasks, 195, 198, 206, 224, 321, 343; formulæ, 10; gold rush, 440; "hold-backs," 316; McKee, 329; marbles, 387; Milville, 222; Nile blue, 14; output, 222; parent color, 10; popularity, 294; pressed ware, 267, 279, 387; problems, 10; pure colors, 136; range of colors, 156; Roman, 15; Salisbury slag,

Colored Glass—*Continued*
238; salts, 139; Sandwich, 294, 295; "Scroll," 419; South Jersey color combinations, 99; Stiegel, 137, 141; tableware, 113, 139, 358; unusual, 409; varieties, 10; Venetian, 17
Columbia Glass Works, painting, 228; specimens, 227
Columbian Centennial, Boston, 286
Compotes, molds, 26
Concklin, Ananias, 64
Congress and Empire Spring Company, 230
Congress Spring Company, 230
Congressville Factory, 230
Connecticut, aid to industry, 192; glass factories, 33, 192 *et seq.*; specimens, 200
Constitution, 431 *et seq.*
Cook, Gershom, 234
Coolman, D. C., 383
Cooper, George B., 220
Core-wound glass, 13
Cork, Ireland, 265
Corn, and development of glass, 49
Corning, Charles, 234
Corning Glass Works, 40, 412
Corning, N. Y., 411
"Cornucopia," design, 375; colored, 445
"Cornucopia, Basket of Fruit," design, 248, 410
Coventry Glass Works, colors produced, 197; identification difficult, 197; output, 196 *et seq.*, 201; tableware, 260; various owners, 197
Coventry, Conn., 187, 442
Covington, Kentucky, 380
Cox, Isaac, 128, 131
Cox & Frazier, agents, 177
Craig, Major Isaac, 379; early mistake, 390; other interests, 215; partnership with O'Hara, 209, 215
Craig, Isaac (grandson), 213
Cramlington, England, 249
Cranch, Richard, buys Quincy factory, 103; financial aid, 105
Crandell, Nathan, 169
Craven, John V., 356
Craven & Brothers, 356
Crawford, Eleazor, 362
Creamers, 123
Crellins, Joseph, immigrant, 101; failure, 102; glass-work promoted, 102
Crocket, Benjamin, 172
Crocketts & Harris, agents, 177
Crosby, James, 373
Crosby, Joshua, 287
Crowley, Samuel, 354
Crowleytown, N. J., 355
Crystal City, Missouri, 8
Crystal Glass, 4; (*see also* Cut Glass)
Culbertson, Alexander, 376
Cullet, 6, 112, 144
Cumberland, Pa., 258
Cummings, Dr., 227
Cunningham, Dominick O., 344
Cunningham, Robert, 344
Cunningham, Wilson, 344
Cunningham & Co., 34, 441, 444; products, 344
Cunningham & Ihmsen, 344, 441
Cunningham & Jackson, 344
Cup-plates, china, 427; classification, 428; designs, 33, 428 *et seq.*; early prices, 429; historic, 429 *et seq.*; makers of, 428; notes on, 427 *et seq.*; "portrait," 434 *et seq.*; present prices, 429; pressed glass, 427; Sandwich, 428, 429; shapes, 428 *et seq.*; ship designs, 429 *et seq.*; use of, 427
Curling, Alfred, 340
Curling, Robert B., 340
Curling, Robertson, 441
Curling, William, 340
Curling & Sons, R. B., 340

Currier & Ives, lithographs, 434
Curtain "hold-backs," 315
Curtis, Calvin, 366 *et seq.*
Curtis, George L., 366
Curtis, Jacob, 423
Cut Glass, 42, 404; Amelung, 178; Bakewell's, 312, 315; crystal chandelier, 307; establishments in Pittsburgh, 339; Gillerland, 413; New England, 276 *et seq.*; Sandwich, 291; tableware, 137, 414; Waterford, 277, 316; wine glasses, 414
Cutter Brothers, 368
Cuyahoga river, 250, 382
Cylinder-glass, 113, 182
Czechoslovakia, 39

"Dahlia" design, 428
"Daisy-and-leaf" design, 423
Dalzell, James, 345
Damascus, Syria, 14
Daniels, Moses, 188
Danner collection, 132
Danvers, Mass., 64
Darling, Thomas, 192
David, William B., 331
Day, Williams & Co., 383
Dealers, 38
Dean, Professor James, 240
Decanters, 178, 245, 276, 294, 339, 402, 411; designs, 246; flint-glass specimens, 304; green, 213; imported, 80; molds needed, 26; sizes, 139; Stiegel, 140
Decoration, 345, 369, 380, 413; Amelung, 178; appliqué, 25, 170; "crackled," 25; cut glass, 414; enameling, 14, 25, 117, 403; engraving, 117, 137; etching, 137; French flair for, 266; gilding, 14, 25, 137; methods, 25; relief, 266; Sandwich, 288; South Jersey technique, 117; South Jersey types, 97; Stiegel, 126, 142; Washington coat of arms, 176
Deerfield, Mass., 188
Delaware, clay discovered, 19
Delaware Water Gap, Pa., 227
Demerara, 274
Demijohns, 50, 99, 149, 150, 222, 245, 338, 383, 406, 416; export, 193
Democratic Press, Philadelphia, 147
Denmark, 55
Dennisville Glass Co., Manufacturing Co., 362
Denny, Ebenezer, 336
Denny & Beelen, 336
Depau, Francis, 235
Derby, England, 307
Description of New Albion, Plantagenet, 49
Designs, bottle, 326, 442 *et seq.*; Chambers, 343; Fort Pitt, 341; generally used, 329; Gothic, 333, Lyon specialties, 333, 335; names, 322, 326 *et seq.*, 329, 343, 346, 348, 350, 375, 392, 407, 409, 417, 423, 428, 435, 436, 442; origin of, 329; portrait, 148, 150, 197, 252, 258, *et seq.*, 317, 435; portrait "salts," 330; "railroad," 305; tableware, 326 *et seq.*; Zanesville, 375
Detroit, Mich., 209
Dewey, John, 189
DeZing & Co., 235
Diamond Glass Co., 384
Dickinson, John, 132
Dielshower, glass-worker, 87
Diffenderfer, Michael, 131
Dill, Isaac, 358
Dillaway, Hiram, 34, 287
Dirkson, Cornelius, 70
Disellburch, Lippe-Detmold, Germany, 317
Distilleries, 440
Dites & McGranigan, 397
Dithridge, Edward, 340
Dobson, John, 286

Doerflinger, Christopher, 411
Doflein, Philip, 33, 150
"Dolphin" design, 328
Dornan, Irish glass-maker, 403
Douglas, Charles, 189
Douglass, George L., 416, 417
Douglass, Rutherford & Co., 418
Douglass, William, 417
Douglass & Taylor, 416
Dowesborough, N. Y., 164
Doyle, John, 287
Doyle, Michael, 287
Doyle, William, 415, 416
Drake's Directory, 379
Dravo, A. C., 324
Druggists' ware, 70, 75, 100, 110, 142, 147, 222, 276, 286, 327, 349, 360, 404, 407; Bodine, 359; bottles, 327; window jars, 327, 353
Dublin, N. H., 242
"Duck" design, 407
Dummer, George, 353
Dunbarton Glass Works, 232
Duncan, George, 344
Duncan & Heisey, 349
Duncan & Sons, George, 349
Dunham, J. K., 396
Dunlap, R. N., 377
Dunmore Glass Co., 237, 238
Dunmore, lake, 236, 240
Durhamville, N. Y., 170, 232; glass-house, 410
Durigan, Hugh M., 152
Dutch glass, 141
Dutch West India Co., 67, 72
Duval, Isaac, 401
Duval & Co., Isaac, 401; colors produced, 402; confused identification, 403; production, 402; quality, 402
Duÿcking, Evert, 94, 95; artist, 74; marriage, 73; position, 72; public service, 73; variations in name, 72
Duÿcking, Gerrit, 74
Dyer, Walter A., 190, 295
Dyott, "Dr." Thomas W., 146, 231, 363, 375, 442; community founded, 149; enterprises, 146; extravagant habits, 147; financial difficulties, 149; glassware agent, 147; patent medicines, 146 *et seq.*
Dyottville Glass Works, 407
Dyottville, Pa., 149

Eads, James B., 422
"Eagle" design, 34, 224, 251, 335, 341, 343, 378, 435, 436, 442
"Eagle-Cornucopia" design, 375
Eagle Glass Co., 350
Eagle Glass Works, 219 *et seq.*
Early American Bottles and Flasks, Stephen Van Rensselaer, 299
Earnest, Matthew, 108, 112; advertisement, 110; New York manager, 113; North river pier, 110
"Ear of Corn" design, 348
East Cambridge, Mass., 184, 274, 295
East Middlebury Glass Co., 239
East Middlebury, Vt., 239
Easton, George F., 346
East Wheeling, 399, 442
East Wheeling Distillery & Pork Packing House, 399
Eaton, Charles F., 370
Eberhart, Adolph, 204, 206
Eberhart family, 253
Eclipse, 440
Edmonds, James, 382
Edwards, Horace H., 423
Ege, George, 123, 133
Egg Harbor river, 357
Egypt, glass industry, 13 *et seq.*; respect for the arts, 14; Eichbaum, William Peter, 210, 215, 307
Eichbaum, Wendt & Co., 215
Eldridge, Joshua, 358

Elizabeth Furnace, 142; first glass-blowing, 120; iron foundry, 120; output, 120; sold, 133; sole Stiegel property, 131
Elizabethtown, Pa., 123
Ellenville Glass Co., 406
Ellenville Glass Factory, 406
Ellenville, N. Y., 406
Elliott, John, 144, 242, 244, 245; druggist shop, 145
Elliott, Samuel, 144; Emmitt, Fisher & Flowers, 274
Encyclopædia, Chambers's, 159
England, 35, 80, 126; first imported glass, 45; flint-glass superiority, 4, 274; glass-making, 18, 266; jealous of glass-trade, 174; Lords of Trade, 111; pressing-machine introduced, 266; secret processes, 282; tea-drinking custom, 427
Ensell, Edward, 307
Ensell & Wilson, 397
Enterprise, 440
Ephrata, Pa., 123, 125; Stiegel tower, 125
Ereman, Peter, 130
Erie, lake, 250, 383, 401
Erie canal, 406
Esopus, N. Y., 74
Essex Glass Works, 162, 181, 185, 233; destruction by gale, 183; factory site, 182; failure, 183; output, 182; reorganization, 182
Estelle, Daniel, 227
Estelle, John, 227
Estelville, N. J., 227, 362
Etna Glass Works, 172
Etter (Etten), Peter, 103
Evans, Thomas, 225
Everhart & Schaum, 299
Evelyn, Robert, 49
Ewan, Jacob, 358
Excelsior Glass Works, 363, 394
Expositions, Centennial, 332, 384; London International, 413; Maryland Institute, 332; Paris, 1867, 332; Pennsylvania Institute Fair, 332
Eyck, Abraham Ten, 166

Fahnstock, Albree & Co., 318, 441
Fahnstock & Albree, 321; stamp marks, 337
Fairview Glass Works, 391
Fallen Timbers, battle of, 208
Families, leading glass-making, 324
F. & A., 444
Farley & Taylor, 420
Farmers Glass Co., 189
Farr, Willoughby, 227
Farrer, Jesse, 189
Faw, Abraham, agent, 178
Fay, Samuel, 188
Fayle, Edwin, 34
Fear, cape, 52
Fearon, Henry Bradshaw, 310
Federal Hill Works, 257, 297 *et seq.*; departments of, 299; failure, 302; Friese management, 298; ownership, 298; Reppert capital, 299
Feree, John, 131
Fessenden, George Lafayette ("Lafe"), 287 *et seq.*, 292; manager of Sandwich works, 287; treatment of labor, 289
Fessenden, Isaac, 287
Fessenden, Sewall H., 287
Fillmore, Millard, 330
Findlay, Ohio, 441
Fish, N. S., 198
Fisher, glass-maker, 142
Fishers, J. & R., 95
Fisher & Gillerland, 412
Fisler, Charles, 364
Fisler, Jacob P., Jr., 364
Fisler & Bacon, 364
Fislerville, N. J., Glass works, 364, 444; stamp mark, 365

Fitsmorris, James, 34
F. L. & Co., 444
Flasks, 99, 150, 151, 352, 416, 417; authenticated Coffin & Hay, 224; Baltimore types, 304; Chapman type, 306; "Chestnut-type," 376; colored, 206, 247, 305, 321, 343, 374, 384, 408; "corset" type, 404; dating, 42; designs, 199, 223 *et seq.*, 247, 392, 410; "Eagle," 34, 148, 320, 322; E. Wormser, 124; gimmal, 16, 291; Grandfather's, 206; hip, 403; Keene designs, 247; kinds, 130; Lafayette Masonic, 393; London design, 198; Masonic variants, 247; molds needed, 26; patriotic, 34; "Penn" marked, 321; Pitkin-type, 193 *et seq.*, 376; quality, 384; "railroad," 305, 408; rare historical, 317; sizes, 130, 247, 321, 364, 368, 374, 409; stamp marks, 195, 357, 376; Stebbins quality, 196; "sunburst," 195; types, 142, 321, 374; whisky, 150, 227, 249, 302, 364; (*see also* Bottles)
Flatbush, Long Island, 73
Flint-glass, 144, 154, 185, 239; Bakewell's 308; decreased demand for, 300; durability, 4; English superiority, 274; first American factory, 81; first successful makers, 311; furnace operation, 21; kinds, 4; materials used in early, 334; New Bremen, 180; O'Hara & Craig, 214, Pittsburgh houses, 340; quality, 363; resonance, 126, 135; St. Louis, 422; Sandwich, 293; Stiegel, 129, 135 *et seq.*, 375; typical formula, 6; West Virginia, 402; white-flint, 423
Flint Glass Association of America, 346
Flint Glass Co., of Providence, 421
Flint Glass Factory, 245
Flint Glass Makers Association, 290
Flint Glass Works, 394
Flips, 16, 109, 123, 141, 291; engraved, 117
Flower, Dr., 296
Flying Cloud, 440
Focer, John, 220
Fonda, Douw, 166
Fordham, Elias Pym, 308
Fordham, Taylor, 231
Formations and Movements of Cavalry, Robert Hewes, 162
Forsyth, Robert, 250
Fort at Detroit, 209
"Fort Pitt Eagle," plate design, 341
Fort Pitt Glass Co., 340, 433
Foster, Charles, 367
Foster, D., 387
Foster, George, 199, 200, 367
Foster, Henry G., 183
Foster, Jeremiah J., 155
Foster, John S., 96, 136, 183; furnace manager, 235; metal-mixer, 234, 241; specimens, 234; superintendent at Champlain, 240
Foster, Joseph P., 193, 366, 367, 441
Foster, Wallace, 367
Foster Brothers, 368
Fox, Albert R., 170
Fox, Isaac, 169, 170
Fox, Samuel H., 170
Fox & Co., 410
Fox & Son, 410
Fox Brothers, 410
Fox, Gregory & Co., 410
France, 35; bottles widely used, 438; decorative superiority, 266; England's rival, 266; glass-making, 17, 18
Frank & Sons, William, 34, 441, 442; "Union," design, 343

Franklin, Benjamin, 75, 101, 173; interest in glass-making, 90, 176
Franklin, Governor, 90 *et seq.*
Franklin, Josiah, 227
Franklin Glass Factory Co., 188
Franklin Glass Works, 155, 222
Franklin Milk, Ohio, 382
Frasor, William, 87
Freas, glass-worker, 87
Fredericktown, Md., 172
Fredericktown, Pa., 299
Free Will Glass Manufactory, 358
Friese, John L., 298, 299
Friese, Philip R. I., 298
Frisbie, inventor, 399
Froelinger, glass-worker, 87
Frothingham, Thomas, 168
Fuels, 6, 22; abundance, 160, 172; anthracite coal, 158; bituminous coal, 158; coal, 167, 209, 274, 285, 303, 356; exhaustion, 16, 82, 167, 194, 197, 240, 246; experiments, 303; grades, 185 *et seq.;* natural gas, 334, 385; preparation for furnace, 358; problem, 53, 385; "rosin-monkey," 303; scarcity, 369; shortage, 336; wood, 85, 113, 121, 235, 283, 303, 408
Fulton, Robert, 430
"Fulton," plate design, 341
Furnaces, bottle-glass, 22; "bucket-teaser," 399; construction, 21 *et seq.;* flint-glass, 21; improvements, 399; largest ever constructed, 347; operation, 21 *et seq.;* smallest, 354; Stiegel, 18; temperatures, 22
Furnival, Alexander, 297 *et seq.*

Gabler, Allan, 95, 207
Gabler, John, 170, 204, 206, 207
Gabler, Joseph, 170
Gabler, Nelson, 170
Gabler, Thomas, 207
Gabler, William, 170
Gabler family, at Brownsville, 251; expert glass workers, 170; specimens, 170
Gaffield, Thomas, 9
Gager, Lester, 354
Galagher, Ralph, 34
Gallagher, Charles, 416
Gallagher, William, 377
Gallatin, Albert, 205, 311, 312; glass interests, 204; immigrant, 202; in Jefferson's cabinet; 205; marriages, 203; real estate ventures, 203; Revolutionary service, 202; teacher at Harvard, 202
Gallatin & Co., 204
Gallatin & Nicholson, 204, 414
Gallipolis, Ohio, 403
Gas, advantages, 334; as fuel, 22; natural, 385
Gasmire, Irish glass-maker, 403
Gates, Sir Thomas, 52
Gaul, 15
Gazette, Lansingburg (N. Y.), 231
Gazette, Richard Scull's, 336
Gazette and Weekly Advertiser, New York, 111
Geneva, N. Y., 231
Geneva, Switzerland, 202
Geography and Genealogy of Vermont, Zadock Thompson, 238
George, S., 403
George's Creek, Pa., 204
"George Washington" design, 442, 445
Gerlach & Co., 235
Germany, 35, 80, 126, 179; clay, 19; enameled glass, 138; exodus to America, 119; glass-making, 18, 84, 141; sheet glass, 5
Getzinger, Christopher, 220
Getzinger, Johann, 220
Getzinger, Joseph, 220
Getzinger & Rosenbaum, 227
Gilbert, Turner & Co., 197, 199
Gillerland, James, 413

Gillerland, John A., 35, 142, 412; medal awarded, 413
Girard, Stephen, 258
Gilson, F. A., 367
Glass, George, 120
Glass, 48; adjunct to architecture, 15; American (*see* separate item) American importation, 80; America's need, 85; ancient development, 13 *et seq.;* beads (*see* separate item); bell, 5; "blanks" 171; blown (*see* separate item); Bohemian (*see* separate item); bottle (*see* separate item); classifications of early, 5; coloration, 9 *et seq.;* composition, 3 *et seq.;* core-wound (*see* separate item); crystal (*see* separate item); cut (*see* separate item); decay, 9; decoration (*see* separate item,) 25; derivation of word, 3; discoloration, 9; discovery accidental, 12; distribution by Rome, 15; druggists' (*see* separate item); effects of burial, 9, 13; embargo on foreign, 239; flint (*see* separate item); general household, 378, 382; German, 5; imported, 91, 175; insufflated (*see* separate item); iridescent (*see* separate item); kinds demanded, 176; looking-glass, 145; manufacture of American (*see* separate item); mellowness of old, 42; modern classes, 5; molds (*see* separate item); opal, 294; opaque (*see* separate item); origin, 12 *et seq.;* production, 8; properties, 4 *et seq.;* resonance, 397; shaping, 5; "sick," 9; spun (*see* separate item); Staffordshire, 265; sun effects on, 9; "tears," 22, 385; tests for identification, 39; unknown to Pilgrims, 47; Venetian (*see* separate item)
Glassboro, N. J., 219
Glassboro glass works, 152 *et seq.*, 217; early output, 153; factories combined, 155; shipping facilities, 158; various owners, 154 *et seq.* (*see also* Stanger family)
Glass-House Company of New York, 107 *et seq.;* copartners, 112; New Found Land, 110; New Windsor work, 112 *et seq.;* property sold, 111; wrecked by Revolution, 112
Glass House Farm, 412
Glass House Riffle, the, 215
Glass Technology, Society of, 12
Glastonbury, Conn., 201
Glossary, 455 *et seq.*
Gloucester Glass Factory, 148
Gloucester, Mass., 202
Gore, Samuel, 183
"Governor De Witt Clinton" design, 445
Grace, Mary McCully, 321
Grace, William, 321
Grady, foreman, 287
Grand Turk, 440
Granger, Henry, 233
Granger, Oscar, 95, 233
Granger family, 230
Granite Glass Works, 366
"Grape" design, 326
Gray, Isaac, 144
Gray & Hemingray, 380, 441
Greece, glass industry, 15
Greely, Horace, 415
Green, Alford, 287
Greenbank, N. J., 362
Green Point, Long Island, 411
Greensboro Glass Works, 374
Greensboro, Pa., 203, 206, 253, 299, 312
Greenville, treaty of, 208
Greiner, Johan Martin, 108, 415
Greiner, Martin, 120
Greisbach, Michael, 120

Grennell, H. M., 383
Grenville of London, Mr., 90
Gue, glass-maker, 251
Guerrière, 432
Guilderland, N. Y., 164, 232
Guildhall Museum, London, 46
G. W. Co., 443

Hagerstown, Md., 123
Haines, Jonathan, 221, 223, 225
Hakluyt, Richard, 52
Hall, Andrew T., 282
Hall, Clement, 85
Hall, Ebenezer, 188
Hall, Henry D., 356
Halledaysburgh, Pa., 331
"Halley's Comet," design, 270, 329
Halter, Caspar, 86
Halter, John Martin, 86
Hamilcar Barca, 16
Hamilton, Alexander, 166
Hammonton Glass Works, 223
Hammonton, N. J., 356, 441
Hancock & Co., 441
H. & S., 444
Hanna, James, 341
Hanne, John, 372
Hanover, N. H., 327
Hanover, Pa., 123
Harcum, Lewis, 349
Harcum, Samuel, 349
Harding, Benjamin, 352
Harding, William G., 187
Harmony works, 155, 156
"Harp," design, 435
"Harp with Star," design, 341
Harrison, William Henry, 261, 317, 435
Harrison & Co., 219
Hartford, Conn., 73, 192
Hartje, estate, 325
Hartshorn, John, 370
Harvey, Sir John, 61
Harzell, Wendell, 130
Hastings, Benjamin, 189
Hastings, Daniel, 274
Hasting's & Co., N., 276
Hatch, John, 242
Haught & Schwerer, 441
Haught, Swearer & Co., 251
Havens, Rensselaer, 168
Hawks Glass Co., England, 171
Hay, Andrew K., 223, 356
Haynes, Benjamin, 287
Hay, Captain John, 319 *et seq.*, 341
Hay, John B., 357
Hay & Campbell, 341
Hay & Co., 357
Hay, Bowdle & Co., 357
Hazard Loomis & Brothers, 196
Hebrew, partner of Maul and Borden, 355
Heidelberg, Pa., 123
Heisey, A. H., 349
Heisey, Clarence, 349
Heisey, Wilson, 349
Heisey works, 40
Helfke (Heefke), Jan, 164
Heller, glass-maker, 361
Henrico, Va., 58
Henry, Patrick, 202
"Henry Clay," design, 345, 395, 428
Henshaw & Jarves, 276
Herbert, Dr. James, 409
Heritage, Joseph, 354
Herrick, Samuel, 372
Hertell, Christian, 108, 112; manager New Windsor works, 113; New York manager, 113
Heston, Colonel Thomas, 154, 155
Heston & Carpenter works, 154
Hewes, Robert, 114; appeal for State aid, 161; death and burial, 163; interest in glass, 159; manager of Essex works, 181; new venture, 162; outside interests, 162; return to Boston, 162; Temple attempts and disasters, 160; varied talents, 162; wealth, 159

Hewitt, George C., 364
Heyberger, William, 228
Higbee, Henry, 340
Hildreth, glass-maker, 406
Hilgenberg, president of Carr-Lowry, 298
Hill, Thomas, 87
Hilt, Nichols, 367
Hilton, Amos, 85
Hirsch, William E., 370
Historical Societies, Camden County, N. J., 153, 226; Newburgh and the Highlands, 112; New Jersey, 85; New York, 72; 108; Pennsylvania, 76, 140; Sandwich, Mass., 293
Historie of Virginia, John Smith, 55
History of American Manufacture, Bishop, 76
History of the Virginia Colony of London, 59
Hitchens, glass-maker, 407
Hoare & Daily, 411
Hobbs, John H., 395, 396
Hobbs, John L., 35, 279, 394, 396
Hobbs, Barnes & Co., 395
Hobbs, Brockunier & Co., 286, 396, 397, 399, 405; output, 395
Hodsden, Lorenzo, 198
Hoffert, Matthias, 120
Hogan, Evans & Co., 324
Hogg, George, chain stores, 250; distribution of glass, 250; family of, 250; hospital founder, 250; immigrant, 249
Hogg, James Breading, 250
Hogg, William, 249
Hohn & Souner, 397
Holden, Andrew, 124
Holgate, Jeremiah D., 364
Holland, 126
Hollingsworth, Thomas & Samuel, agents, 179
Hollow-ware, 214, 352
Holmes, Nathaniel, 362
Holmes, Obadiah, 64
Holmes, Oliver Wendell, 432
Holmes & Southwick, factory, 66
Holtz, William, 356
Holtz, Clark & Taylor, 356
Holz, Elizabeth, 121
Hookset, N. H., 370
Hope Glass Works, 350
Horn, Isaac van, 372
Horton, J. D., 383
Houghton, Emory, Sr., 412
"Hound." design, 435
House, George E., 405
Howard, Homer H., 298
Howe, Captain Joseph N., 279
Howe, Captain Timothy, 281
Huber, Elizabeth, 119
Huber, Jacob, 119
Huber, Joe, 119
Huber, Magdalena, 119
Hudson, Henry, 67
Hudson river, 231; early names, 67
Huffsey, John, 355
Huffsey & Co., J., 356, 360
Hull, Captain Isaac, 432
Hunnewell, Jonathan, 183
Hunnewell, Richard, 181
Hunnewell & Gore, failure, 185; new factory, 185; reorganization, 186
Hunter, Dr., 137; collection, 139
Hunter, H. & T., 414
Hunter, Samuel, 387
Hurry, Renwick, 38

Ihmsen, Charles T., 324, 337 *et seq.*, 350
Ihmsen, Dominick, 344
Ihmsen, William, 320, 337, 338
Ihmsen & Ulam, 350
Illinois, O'Hara estate, 209; sand beds, 7
India, 17; ancient and modern glass, 14; Punjab, 14
Indiana, 39; manufacture, 259; O'Hara estate, 209

Indianapolis, Ind., 259
"Indian Queen" design, 348; colored, 445
Indians, American, 4; and Jamestown settlers, 57; beads, 57
India Point, R. I., 421
Ingleson, Forbes & Co., 235
Inns, 109, 111
Insufflated glass, 29 *et seq.*, 31, 142, 196, 347, 369, 376; characteristics, 30; colored, 279; decanters, 294; New Bremen, 180; patterns, 30 *et seq.*; varieties, 246
Ireland, 80; flint-glass, 4; glass-making, 18, 277; secret processes, 282; Waterford ware, 277
Iridescent glass, 30; due to burial, 13
"Irish Harp" design, 335
Iron, 7; Elizabeth furnace, 119; first works in America, 59; furnaces suppressed, 80; molds, 26, 28; output, 121; oxide, 10; parent color, 10; sulphate of, 8
Iron and Glass Dollar Savings Bank, 346
Isaacs, Lazarus, 137
Isabella Glass Works, 363, 444; authentic specimens, 364
Italy, revival of glass-making, 15 *et seq.*
Izard, Gabriel, 359
Izard, Joseph, 359, 360

Jackson, Andrew, 260, 351
Jackson, George Whitten, 344
Jackson flask, 34
Jackson Works, 351
Jacoby, C., 384
James, Dr. F. H., 408
James & Gatchell, 408
James, Gatchell & Co., 408
Jamestown, Virginia, 16, 58, 59; (*see also* Virginia)
Janes, Smith & Co., 240
Jansen, Catherine, 84
Jansen, Routoff, 69 *et seq.*
Japan, 35, 39
Jars, 99, 151, 349, 359, 416; fruit, 361, 407; Haines patent, 378; Mason, 354; patented fruit, 354
Jarves, Deming, 10, 35, 269, 274, 281, 286, 288, 292, 329, 332, 335, 398, 422; artistic ability, 275; book on glass-making, 311; death, 296; experiments, 275, 293; improved pressing-machine, 278; new-company founded, 277; new works, 295; organizes own company, 282 *et seq.*; red lead introduced, 340 (*see also* Sandwich glass)
Jarves, George D., 281
Jarves, John, 295, 296
Jarves & Commerais, 281
Jasper, 4
Jefferson, Thomas, 79, 205; interest in American glass-making, 176
"Jefferson" flask, 34
Jefferson Glass Factory, 338
Jenkins, Elisha, 168
Jenkins, Frederick, 168
"Jenny Lind" design, 403, 418, 429, 445; colored, 444; Huffsey, 365; Milford, 360, 365; Ravenna, 365, 384
Jersey, South (*see* South Jersey)
Jersey City Flint Glass Works, 353
Jersey City Glass Company, 353
Jersey City, N. J., 353
Jewelry, glass, 414
"John Adams" design, 445
Johnson, Abiel, 199
Johnson, Elisha, 199
Johnson, Mat, 95, 368
Johnson, Thomas, 173
Johnson, King & Co., 348
Jones, Edmund, 373
Jones, Epapheas, 236 *et seq.*
Jones, Ephraim, 209
Jones, John, 296

Jones & Co., Philip, 151
Josephus, on origin of glass, 12
Josiah, James, 219
Journal of Travel into Arkansas Territory, A, Thomas Nuttall, 310
J. R. & S., 443
J. R. & Son, 443
Junk bottles, 50

Kane, James, 168
Kearney, Philip, 234
Kearns, George W., 373, 377
Kearns, Noah, 377
Keene, N. H., glass worker, 33, 142, 197, 242 *et seq.*, 257, 366, 374, 375, 441; flask types, 247 *et seq.*; Mellen,'s Tavern, 242; specimens, 244, 369; stamp marks, 337; tableware, 260
Keep, glass-maker, 407
Keliner, Chauncey, 230
Kendall & Patten, 253
Kenney, foreman, 287
Kensington Glass Works, 146, 444; Dyottville, 149; identification, 150; range of colors, 150; tableware, 150; (*see also* Dyott)
Kensington, Pa., 375, 407
Kent, Charles H., 383
Kent, Marion, 383
Kent, Ohio, 382, 383
Kent, Wells & Co., 383
Kentucky, cutting industry, 414; glass industry, 376, 414 *et seq.*
Kentucky Glass Works, 416, 417, 420; ornaments, 419; stamp mark, 420
Kerfoot, J. B., 36
Kern, Samuel, 287
Kern, Theodore, 287
Kerr, innkeeper, 307
Keyes, Homer Eaton, 271, 327 *et seq.*
Kimber, Benedict, 251, 252, 441
Kinder, Robert, 307
Kinder, Thomas, 307
King, Cardenio, 291
King, D., 189
King, John M., 321
King, L., 189
King, William S., 348
Kieft, Director, 68
Kilgore & Hanna, 385
Klein, workman at McCully's, 321
Knieal, glass-worker, 87
Knittle, Earl J., 409, 419
Knowles, Richard, 405, 442, 443
Knowles & Taylor, 386
Knowlton, D. A., 230
Knox & McKee, 442; export, 391; many interests, 390; production, 391
Koch, glass-maker, 370
Kœchlein, George, 34
Kossuth, Louis, 34, 150; flask, 34
Krack, John A., 417
Krack, Reed & Co., 417
Krack, Stanger & Co., 417
Krack & Co., J. A., 417
Kramer, Baltzer, 204
Kramer, Christian, 204, 206, 207
Kramer, Sophia, 207
Kramer, Wilhelmina, 207
Kramer family, expert glass-makers, 203 *et seq.*, 206
Kreismeyer, Simon, 86
Kupfer, Charles F., 181 *et seq.*; son's letter, 183
Kupfer & Loring, 183

Labadist Fathers, 74
Labor, glass strike, 290, 347, 362
"Lace," glass, 268, 292; pressed, 38
Ladd, David, 381
Lafayette, George Washington, 312
Lafayette, Marquis de, 197, 431; flask, 148, 392; visit to Bakewell's, 311; visit to Wheeling, 392
Lafayette-Masonic bottle, 393
La Fleur, glass-maker, 210, 216

La Granja, Spain, 16
Lambert Brothers, 183
Lamps, 48, 65, 91, 200, 398, 411; Bakewell's advertised, 313; Bryce, 326; chimneys for oil, 396; mosque, 14; oil, 347, 396; opal, 294; pressed glass, 347; Sandwich, 290, 291, 294, 333; shades, 294
Lancaster Co., operative Glass Works, Ltd., 408
Lancaster Glass Works, 408, 443; stamp mark, 409
Lancaster, N. Y., 408
Lancaster, Pa., 120, 122, 123, 129, 238, 375
Landgraft, Anthony, 410
L. & W., 444
Lane, Matthew, 234
Lanesboro, N. Y., 170
Lansingburg, N. Y., 231
Lanterns, 315, 350, 380
Lapham, C., engraver, 287
Lapham, Charles W., 285
Lapham, William, 287
Launay et Cie., France, 291
Lazerville Bottle Works, 405
Leacock, James, watch-maker, 144
Lead, red, 6, 135, 334, 340, 395; combinations, 4; source, 380;
Lebanon, Pa., 123
Ledlie, James E., 341
Ledlie & Ullam, 350
Lee, James, 219, 221
Lee, Thomas, real estate development, 202
Leighton, John, 280
Leighton, Thomas, 35, 279; color-mixer, 137; romantic career, 280
Leighton, Thomas, Jr., 280
Leighton, Thomas III, 280
Leighton, William, 280; invention, 397
Leighton, William, Jr., 397
Leiper, Thomas, 109, 110, 145
Leland, John D., 187
Lenox Iron Furnace, 191
Lenox, Mass., 191
Leon, Abraham de, 439
Leopold, glass-maker, 415
Lepper, Thomas (*see* Leiper)
Letters and an Abstract of Letters from Pennsylvania, 76
Lewis & Co., Joseph L., 219
Lewisville, N. J., 351
Libbey, Edwin Drummond, 280
Libbey, William L., 280 *et seq.*
Libbey & Son, W. L., Proprietors of the New England Glass Works, 281
Libbey Glass Co., 281
Lighting fixtures, 411, 421; chandeliers, 316; lamps (*see* separate item); lanterns (*see* separate item)
Lilliendahl, O. D. W., 228
Lime, 7, 397; combinations, 4; potash, 4; soda, 4
Lincoln, Thomas, 122
Lind, Jenny, 150, 156
Lippet, Arnold, 373, 377
Lippincott, Wisham & Co., 360
Livingston, Robert, 430
Livingston family, 229
Lloyd, Benjamin, 287
Lloyd, James D., 288, 295
Lloyd, Samuel, 287
Lockport Glass Works, 198, 407, 444
Lockport, N. Y., 259, 406
"Log Cabin," design, 345, 435, 436
London Company, The., 49, 52 *et seq.*; Rolls promoted, 57
London, England, 140
Looking-glass, Amelung, 178; manufacture, 145
Loomis, Smith & Co., 240
Lorenz, Frederick, Sr., 319, 320, 441; acquired plants, 317, 318; death, 318; in O'Hara factory, 317; output, 318; poor immigrant, 317

Lorenz, Frederick, Jr., 318
Lorenz, Frederick Rudolph Joacim, 317
Lorenz, Mary, 321
Lorenz, Moses, 319
Lorenz & Co., Frederick, 441
Lorenz & Wightman, 34, 442; names and owners, 318; "Union," design, 343
Loring, Caleb G., 183
Loring & Co., Caleb G., 183
"Louis Kossuth," design, 34, 445; colored, 444
Louis Philippe of France, 372
Louisville Glass Works, 34, 414, 417, 418, 443; boat equipment, 415; designs, 409; stamp mark, 418; stockholders, 415
Louisville, Ky., 8, 203, 414
Lovett, foreman, 287
Low, Isaac, 229
Low Countries, 45; glass-making, 18
Lowell, Mass., 185, 369
Ludlam, Christopher, 362
Ludlam, Richard, 362
Ludlow & Gould, agents, 177
Ludlow Manufacturing Co., 190
Ludlow, Mass., 190
Lutz, foreman, 287
Lyman, Joseph, 383
Lyndeboro Glass Co., 370
Lyndeboro, N. H., 367
Lynn, Mass., 64
Lyon, Alexander P., 331
Lyon, James, color-mixer, 136
Lyon, James B., 35, 268, 398; early efforts, 331; experiments, 334; generosity to competitors, 334; glass company started, 331; Jarves's opinion of, 335; medals received, 332; place in industry, 332; (*see also* Lyon & Co.)
Lyon, John, 331
Lyon & Co., James B., designs originated, 333; furnace capacity, 331 *et seq.*; identification difficult, 269; pressed glass its main production, 332; specialties, 334; wares exhibited in Paris, 332; workmen expert, 333; (*see also* Lyon, James B.)
Lyon, Shorb & Co., 331
Lyon Works, 33
"Lyre," design, 341, 435

Mc. & Co., 444
McCallen, McGregor & Co., 165, 166
MacCarthy, Frank, 200
McCarty, Irish glass-maker, 403, 418
McCarty & Torreyson, 443
McCluney, James, 398
McClure Brothers, 368
McCord & Shiner, 412
McCully, John, 321
McCully, William, 34, 216, 348; business ventures, 320; death, 321; glass-making experience, 319
McCully & Co., 442
McCully & Hay, 320, 434
McCully Co., William, 320
McDaniel, Daniel, 120
McFarlane, James, 200
McGowin, F., 338
McKay, Donald, 440
McKearin, George S., 36, 217, 237, 423
McKearin, Helen A., 30
KcKee, C. J., 324
McKee, Colonel, 390 *et seq.*
McKee, Daniel, 324
McKee, Frederick, 323
McKee, F. & J., 324
McKee, James, 323
McKee, James II, 323
McKee, Samuel, 323, 324
McKee, Sellers, 323
McKee, Stewart, 323
McKee, Thomas, 323

McKee, William, 323
McKeen, J. B., 254
Mackbeth-Evans, 347
Macklin, partner of Adams, 345
McKee & Brothers, 324; identification difficult, 269; catalogue, 327; colors produced, 329; list of products, 327; prices, 328; terms of sale, 327
McKee & Co., S., 323 *et seq.*
Madeira, 63
Magoun, Thatcher, 431
Maid of the Mist, 432
"Major Ringgold" design, 445
Malaga, N. J., glass works, 222
Manchester, Conn., 192, 195, 236
Manchester, Mass., 64
Manchester, Pa., 215
Manganese, 8
Manheim Glass Works, 122 *et seq.*, 143; business depression, 126; community growth, 122; lost to Stiegel, 131; output, 140; prosperity, 124; sale advertised, 128
Manheim, Pa., 28, 120, 179, 216, 238; Stiegel mansion, 125
Mansell, Sir Robert, 45
Mansfield, writer, 379
Mansfield, Alonzo J., 407
Mantua, Ohio, 381
Manual Labor Bank, 149
Manufacture, 301, 397; ancient craftsmen, 13 *et seq.;* boat furnishings, 429; bottle-houses, 7; centers, 33 *et seq.;* chemical problems, 275; chemical substitutes, 167; chilling process, 28, 398; clay pots, 19 *et seq.;* color problems, 10; competition, 269, 386, 399; coöperative houses, 326, 361, 362; decline and revival, 15 *et seq.;* difficulties attending, 257; distribution, 268; domestic demanded, 260; early correspondence, 75; early forms, 17; early phase ended, 265; early problems, 21; factories, 36 *et seq.*, 40; failures, 61, 82; family traditions, 218; Federal aid asked, 174 *et seq.;* finishing processes, 23, *et seq.*, 27; first American, 59, 159; first New England factory, 48; first successful flint-glass works, 311; first successful house, 184; five early firms, 95; foreign competition, 263, 413; French designs, 266; furnaces (*see* separate item); general revival, 82; Government encouragement, 81, 257; innovations, 373, 396; interesting experiment, 172; Jamestown settlement, 54; labor troubles, 289, 290, 347; leading families, 324; Leighton process, 265; lime-glass process, 280; machine age, 265 *et seq.;* mergers, 154 *et seq.;* methods, 13; Middle Ages, 17; middle west development, 96, 259; molds (*see* separate item); number of factories, 38; output in 1870, 262; pressed glass, 268, 286; pressing-machine invented, 264, 277 *et seq.;* 398 problems of refraction, 413; processes, 8, 19 *et seq.;* production costs, 8, 21; promoted in colonies, 89 *et seq.;* Quaker works, 76; reports to England, 90 *et seq.*, 111; retail stores, 146; revolutionary change, 277; rivalry in designs, 269; secret processes, 17, 86; strikes, 290, 347; terms used, 455 *et seq.;* tools, 19 *et seq.*, 29; war effects, 182, 215, 226, 236, 262, 289, 296, 353, 367, 396, 399; west of Mississippi, 422; workmen (*see* separate item); wrecked by Revolution, 81, 93, 113, 127; Zanesville works, 372
Marblehead, Mass., 64
Marietta, Ohio, 372

Mark, Thomas, 373
Marks, glass-maker, 406
Marlboro, N. H., 245
Marlebone, England, 192
Marpole, Davis J., 372
"Marquis de Lafayette," design, 445
Marshall, Ann, 221
Marshall, Captain James, 86
Marshall, John, 357
Marshall, Randall, 221
Marshallville, N. J., 221, 357
Martin's Ferry, Ohio, 394, 399
Maryland, 36, 142; glass-works, 198; sand beds, 7
Maryland Glass Works, 305
Maryland Journal and Baltimore Advertiser, 177
Mason, James, 189
Mason, J. L., 354
"Masonic" design, 410, 445; colored, 444
"Masonic-Eagle" design, 374
Massabesie Pond, N. H., 186, 369
Massachusetts, 142, 175; early houses, 181 *et seq.;* flint-glass, 4; glass-works, 141, 162; government aid to glass industry, 101, 105; lottery legalized, 105; State aid for glass-making, 181
Massasoit, Chief, 66
Mather, John, 195, 196
Mather, Samuel, 166
Mather, Thomas, 166
Mathews, foreman, 287
Mathews, Samuel, 362
Maul, William, 355
Maul, Hebrew & Co., 355
Maurice River, 7, 284, 369
Maysville, Ky., 414
Medford, Mass., 431
Medford (N. J.) glass works, colors produced, 361; identification difficult, 361; output, 361
Meigs, siege of Fort, 436
Melcher, Keener, Agents, 177
Mellish, John, 379
Melyer, Jacob, 74
Merchant's Coffee House, 111
Mercury, New York, 110
Mercury, Pittsburgh, 148
Merrick, Harvey, 200, 406
Merrimac river, 185
Mesiers, Peter, 110
Mesopotamia, beads, 12; glass-making, 12, 13
Messer, B. F., 366
Messer & Curtis, 366
Metropolitan Museum of Art, 139
Mexican war, 201
Middlebury, Vt., 238; Sheldon Museum, 239
Middlesex, Mass., 185
Middletown, Pa., 64, 123
Mifflin, Governor, 173, 176
Milford, N. J., glass works, 360
Miller, Daniel H., 222, 351
Miller, Godfried, 345
Miller, Michael, 120
Millersville, Pa., 318
Mill Village, N. J., 366
Millville Glass Works, 221
Millville, N. J., 219, 220
Milnor, Joseph K., 353
Misky, Benjamin, 120
Missouri, clay, 8, 20; sand beds, 8; sandstone, 8
Mitchell & Irwin, 220
Molds, 26 *et seq.;* ancient, 13; clay, 26, 222, 226; cooling methods, 28; copper, 13; core, 26; designers, 33 *et seq.;* designs, 38; European, 122; factories, 33 *et seq.;* German designers, 194; individual, 38; makers, 33 ; matrix, 13; metal, 26, 28, 222; part-sized, 28 *et seq.*, 137, 180; pattern, 28 *et seq.*, 135, 206, 374, 375; pressed-glass, 264; seams, 27 *et seq.;* section, 26, 180, 264; shapes, 13; stock

Molds—*Continued*
designs, 32, 399; surface-pattern, 27; varieties, 26 *et seq.;* "Venetian diamond," 28; wood, 26
Monongahela City, Pa., 320
Monongahela river, 205, 258, 318, 337, 376, 401, 440; glass houses on, 249 *et seq.*
Monongahela River House, 441
Monroe, Edmund, 282
Monroe, James, 308
Moore, Amos C., 362
Moore, Dr. D. Wilson, 364
Moore, John M., 364
Moore, Mark, 188
Moore & Co., John M., 364
Moore Bros. & Co., 364
More, Dr., 75
More, Governor Henry, 111
Morris, Justice G., 387
Morris, Robert, 151
Morson, Charles, 38
Mosaics, 14
Moscow, Ohio, 380
Motto, 434
Mountain Glass Works, 233
Mount Holly, N. J., 321
Mount Pleasant, N. Y., 229
Mt. Washington Glass Co., 281
Mowrey, glass-maker, 415
Mugs, 16, 123, 138, 141; enameled, 117; "Friendship," 403
Muhlenberg, Henry Melchior, 120
Muldoon, Christopher, 136, 293
Mullica river, 355
Mulvaney, Patrick, 341
Mulvaney & Co., 341
Mulvaney & Ledlie, 325, 341
Muncie, Indiana, 380
Munsell (*Annals of Albany*), 167
Murano (*see* Venetian glass)
Murdock, Thomas, 377
Murdock & Cassel, 374; stamp mark, 377
Muskingum river, 377
Myerhoff, Francis, 227
Myers, George H., 34

Nails, a rarity, 124
Nancy, 119
Nansell, Sir Robert, 53
Natchez, 440
National Chronicle, Philadelphia, 148
National Flint Glass Manufacturers Association, 332
National Intelligencer, 423
Natron, 12
Naumkeag (*see* Salem, Mass.)
Nazel, Christian, 120
Neaufville, John de, 171; and American independence, 164, 192; poverty, 165
Neaufville, Leonard de, 171; and American independence, 164, 192
Nemackolins Path, 258
Neri, Antonio, 3
Netherlands, glass-making, 68
New Albany Glass Works, 253
New Amsterdam (*see* New York City)
Newark, Ohio, 349
New Boston Glass Works, 253
New Bremen Glass Works, 172 *et seq.;* agents, 177; authentic specimens, 176, 177; failure, 203; offered for sale, 175; output, 177 *et seq.;* place in glass-making, 180; prospects, 176; quality, 178, 179; various names, 172
New Bremen, Md., 172, 252, 402
Newburgh, N. Y., 412
New England, 36, 341; first glass-works, 48; glass-making revived, 101; Lee and Williamstown failures, 102; Quincy-Braintree factory, 103 *et seq.;* (*see also* individual States)

New England Glass Co., 40, 95, 141, 274 *et seq.*, 295, 338, 394, 412, 442; capitalization, 276; change in management, 280; coal as fuel, 274; expert workmen developed, 280; first success in America, 184; insufflated type, 279; name changes, 281; owners, 274; removal to Ohio, 281; variety of output, 275, 277; wares advertised, 276
New England Glass Works, W. L. Libbey and Son, Proprietors (*see* New England Glass Co.)
New Geneva Glass Works, extent, 204, 206; Fayette County house, 206; Green County house, 206; new owners, 206; output, 204; sale, 205
New Geneva, Pa., 204, 299
New Granite Glass Works, 367, 376
New Hampshire, 142; first glass-making in United States, 159; glass factories, 33, 186; Hewes appeal for State aid, 161; lottery legalized, 161; Temple works, 159 *et seq.*
New Hampshire Glass Co., 242; expenditures, 243; sale of shares, 244; successive owners, 243
New Hampshire Sentinel, 242 *et seq.*
New Jersey, 36, 39, 369; archives, 87; colonial towns, 85; early factories, 76, 82; extent of industry, 218 *et seq.*; glass-making, 152 *et seq.*; Port Elizabeth, 219; sand beds, 7; second South Jersey group, 217 *et seq.*; third group, 351 *et seq.*; Wistar works, 85 *et seq.*; workmen sent to Boston, 182; (*see also* South Jersey glass)
New Jersey Window Glass Co., 76
New Lebanon, N. Y., 412
New London Glass Co., 198
New London, Conn., 198, 444
Newport, Captain Christopher, 52
Newport, R. I., 429
Newton, Long Island, 69
Newspapers, advertisements, 6, 91, 110, 127, 129, 144, 145, 178, 205, 211, 212, 213, 228, 231, 244, 245, 276, 286, 309, 313, 341, 360; description of runaway, 92; lottery sale, 131; notices, 105, 111, 215
New York State, bottle specimens, 230; Ellenville interests, 198; Erie Canal opened, 258; glass-making, 141; glass works, 229 *et seq.*; later works, 406 *et seq.*; number of plants, 232; sand beds, 7; Saratoga Springs, 229; Springs, 230; Ulster and Orange counties glass-house, 112; (*see* Albany *and* Rensselaer)
Nicholls, Mrs. Francis M., 38, 276 *et seq.*
Nicholson, Commodore James, 203
Nicholson, Hannah, 203
Nicholson, James Witter, 203, 205
Nicholson, John, 151
Nicholson, William, 358
Nickerson, Nathaniel, 188
Nimick, Alexander W. K., 319
Nissle, Henry, 137; special designs, 138
Norcross, Samuel, 354
Norcross, Ulrich, 354
Normandy, 17
North Carolina, 52; rosin, 303
Northwood Glass Co., 405, 442
Norton, William, 59
"Not For Joe," design, 445
Novelty Glass Mold Works, 33
Nuttall, Thomas, 310
New York City, 36, 67, 107; Battery Park, 140; glass works, 68 *et seq.*, 412; growth, 68, 72; imports, 69; newspapers, 6; races in, 68; sightseeing, 111

"New York," design, 328
New York Gazette, 110, 111
New York Gazette and Weekly Advertiser, 129
New York Glass Co., 108

Obsidian, 4
O'Connor, Johnson, 247
O'Hara, James, 114; army service, 208; banking interests, 215; death, 215, 317; financial troubles, 215; first glass works, 209 *et seq.;* partnership with Craig, 209, 215; Schenley estate, 209
O'Hara & Craig, 6, 151, 297, 321; capacity, 210; cost of works, 212; first in Pittsburgh district, 216; goods advertised, 213; marked flasks, 321; new owners, 317; output, 210, 213, 214; Pittsburgh works, 208 *et seq.;* price-list, 214; reward offered for clay, 211
Ohio, 36, 142, 259; Cincinnati Glass Works, 379 *et seq.;* market control, 289; O'Hara estate, 209; sand beds, 7; various glass works, 381; Zanesville Glass Works, 372 *et seq.*
Ohio Land Co., 202
Ohio river, 202, 249, 376, 379, 392, 401, 440
Oil, discovery, 396
Old Brooklyn, N. Y., 357
Old Colony Railroad, 285
"Old Glory" design, 224
Old Ironsides, Oliver Wendell Holmes, 432
O'Leary, William, 341
Olive Glass Works, 147, 154, 156
Oneida Glass Factory Co., 233
Oneida lake, 232, 410
Onyx, 4; glass imitations, 15
Opaque glass, American, 11; "Banker's Inkwell," 294; English Bristol, 11; experiments in, 293; tiles, varieties, 11
Opechancanough, Chief, 61
Osceola, 285
Owens, glass-maker, 35
Owens Bottle Co., 156
Oxide, manganese, 6; metallic 6, 10

Paca, William, 173
Packard, glass-cutter, 287
Packwood, Nehemiah, 296
Pad method, 13
Page, Benjamin, 307
Palestine, 12
Palmer, Joseph, additional interests, 104; buys Quincy factory, 103; financial aid, 105; Revolutionary service, 106
Pancoast, Joseph, 356
Parish, Samuel, 219
Parke, John E., 341
Parke, Campbell & Hanna, 341
Parker, William, 186
Passamaquoddy, Me., 202
Pastorious, agent, 76
Patapsco river, 297
Patent medicines, advertisements, 148; demand for kinds, 410; Dyott's, 146 *et seq*; Robertson's, 147, 148; varieties of cures, 148; (*see also* Bottles)
Patterns (*see* Designs)
Patton, H. B., 342
Pauk, Henry, 382
Payne, Edward, 181
Peabody, Mass., 64
Peacock, William, 354
Pearlash, 284, 334, 379, 380, 395
Pears, John Palmer, 315
Pears, Thomas, 315
Pears, Thomas C., Jr., 316
Pearson, George, 168
Peck, Dr. John, 240
Peck, Oliver, 191
Pellat, Apsley, 10
Pembroke, N. H., 186

Pendleton Glass Works, 360
Pendleton, N. J., 360
Penn, John, Jr., 209
Penn, William, 439
Penn Glass Works, 318
Pennsylvania, 16, 36, 132, 138, 142; breweries, 249; distilleries, 249; flood of 1852, 320; glass-making, 16, 75, 144, 249; Green County house, 206; history of glass-making, 76; New Geneva works, 204; O'Hara & Craig, 208; Pittsburgh works (*see* separate item); sand beds, 7
Pennsylvania Furnace, Pa., 331
Pennsylvania Gazette, 91, 144
Pennsylvania Gazette and Weekly Advertiser, 127
Pennsylvania Journal, 93, 131
Pennsylvania Museum of Art, 62
Penton, Amos, 85
Pericles, Golden Age of, 15
Perkins, N. S., Jr., 198
Perry, Dr. Justus, 245
Perry, Justus, Jr., 441; glass-making, 245; quality of output, 246; stamp marks, 337; types of product, 248; war service, 245
Perry, Martha Frost, 245
Perry & Wheeler, 245
Perry & Wood, 245
Perry, Wheeler & Co., 245
Perryopolis, Pa., 253
Persia, ancient and modern glass, 14
Personal Narrative of Travel, Elias Pym Fordham, 308
Peru, N. Y., 367
Peterboro, N. Y., 232
Peters, Hugh, 63
Petree, Daniel, 232
Petrie, Sir Flinders, 12
Pettee, Hiram, 191
Pettee, Seneca, 191
Pewter, 46, 69
Pfotzer, Daniel, 155
Phelps, Wm. A., 191
Phenicians, 16
Philadelphia & Kensington Glass Factory, 148
Philadelphia, Pa., 79, 210, 441, 442; Centennial Exposition, 140; Franklin Institute, 312; newspapers, 6
Phillips, glass-maker, 337
Phillips, James, 398
Phillips & Best, 349
Phœnix Glass Co., 320
Pierce, Francis M., 365
Pierce, partner of Coffin, 356
Piesch, Abraham, 228
"Pike's Peak" design, 350, 445
"Pineapple" design, 326
Pioneers, glass and the, 47, 50
Pitchers, 24; molds for, 26
Pitkin, Elisha, 192
Pitkin, Richard, 192
Pitkin, William, 192
Pitkin Glass Works, distribution of product, 194; first in Connecticut, 193; flasks, 375; output, 193, 201; quality of work, 193; ruins preserved, 194
Pittsburgh, Pa., 8, 71, 198, 238, 257, 312, 441, 442; Bakewell's 307 *et seq.*; Birmingham district, 337; Carnegie Library, 214; fire of 1845, 325; flint-glass, 4; glass factories, 6, 34, 208 *et seq.*, 307 *et seq.*, 317 *et seq.*, 323 *et seq.*, 331 *et seq.*, 336; influx of workmen, 210; market control, 289; number of houses, 332; O'Hara & Craig, 208 *et seq.*, plate-glass industry, 210; pressed-glass making, 268; Sligo district, 318; South Side district, 347; tableware, 141; Western Pennsylvania Hospital, 250
Pittsburgh Daily Gazette and Advertiser, 338

Pittsburgh Gazette, 205, 211, 215, 339
Pittsburgh Glass Works (*see* O'Hara & Craig)
Pittsburgh Glass Manufacturing Co., 342, 347
Pittsburgh Green Glass Co., 346
Pittsburgh Mercury, 308, 313
Plantagenet, writer, 49
Plates, 33; cup (*see* separate item); pictorial, 96; varieties, 427
Plattsburg, N. Y., 234
Pleasant Mills, N. J., 355
Pliny, 14; on origin of glass, 12; "Plow" design, 341, 428, 435
Plunkett, F., 338
Plunkett & Miller, 394
Point Comfort, Va., 52
Pointts, John, 60
Poitou, 17
Polly, 285
Pontil, mark, 39, 142, 238, 438; use, 23
Porcelain, Chinese, 11
Porphyry, glass imitations, 15
Port Elizabeth Glass Works, 219
Port Elizabeth, N. J., 220, 364
Porter, Joseph, acquired Waterford works, 225; Sunday shutdown, 226; philanthropic works, 226
Porter, William C., 226, 361
Porter & Sons, Joseph, 225
Porter, Shreve & Co., 225
Potash, 4, 7, 211, 269, 379; carbonate, 6; combinations, 4
Potassium, 10
Potomac river, 52
Potter, Colonel David, 355
Potter & Bodine, 355
Pottery, 211; kinds of clay, 19; life of glass-pots, 21, 334; predecessor of glass, 19; process for making pots, 20; red glazed, 373
Powhatan, Chief, 55, 61
Prague, 265
Prather & Smiley, 213
Precious stones, imitations, 13
Pressed glass, 32; bar goods, 398; Bryce output, 326; colored, 267, 387; cup-plate, 345, 427; degeneracy, 289; demand for, 278, 279, 398; English, 266; exported to England, 278; first article made, 286; French, 266; Gothic designs, 292; importations, 35; in general use, 332; "lace," 38; lamps, 347; Lyon models, 332; Lyon quality, 332, 334; machine invented, 264, 277 *et seq.*; market control, 289; method of producing, 264; patterns, 39, 270, 272; production, 35; quality, 399; resonance, 40; rivalry in production, 278; Sandwich, 291; tableware, 279, 326, 347, 386
Pressing-machine, 277
Presstman, George, 297
Price, William, 213, 340
Processes, 19 *et seq.*
Providence, R. I., 79, 193, 237
Providence Journal, 421
Pugh & Teeter, 380
Putnam, Timothy, 370
Putnam Flint Glass Works, 378
Putnam, Ohio, 377

Quakers, 76, 84
Quincy, Colonel John, 103
Quincy, Norton, 102
Quinn, foreman, 287

Race, cape, 250
Rago brothers, 135
Railroad, development, 260; first in United States, 305
Ramsey, glass-maker, 415
Rapelje, Rem, 112
Ravenna Glass Co., 383
Ravenna Glass Works, 444; specimen bottles, 384

Ravenna, Ohio, 198, 238, 383; glass industry, 384
Reading, Pa., 120, 123
Records of the Colony of Massachusetts Bay, 64, 65
Redford, N. Y., glass works, 234, 240; specimens, 241
Redwood Glass Manufacturing Co., 235
Redwood Glass Works, 235, 240; specimens, 241
Red Stone creek, 253
Redstone Old Fort, Pa., 253
Reed, William, 417
Reed, Allen, Cox & Co., 408
Reed & Brother, L. S., 417
Rees, James, 233
Reid, John, 169
Reitz, Lewis, 204
Religion, among glass-makers, 324
Remarks on Manufacture, Principally on the New Established Glass House near Frederick—Town in the State of Maryland, John Frederick Amelung, 172
Reminiscences of Glass Making, Deming Jarves, 10, 311
Rensselaer Glass Factory, 169 *et seq.*
Rensselaer Glass Works, 168
Repley & Co., 349
Report on Manufactures, Albert Gallatin, 311
Report on the Manufacture of Glass, Weeks, 75
Reppert, Catherine, 207
Reppert, George, 95, 204, 206, 207, 299
Reppert, Jacob, 299
Reppert, Lewis, 299
Reppert family, at Federal Hill Works, 298
"Resurgam-Phœnix," design, 445
Revere, Paul, 79
Reynolds, Thomas, 373
Rhode Island, 421
Rice, A. H., 227
Rice, Ebenezer A., 367
Rice, Henry, 282
Rich, Jacob, 188
Richards, Samuel, 351
Richards, Thomas H., 351
Richards, Thomas, Jr., 351
Richardson, Daniel, 186
Richmond, James N., 191
Richmond, William, 169
Richmond, Ky., 420
Richmond, Va., 79, 203, 421, 444
Ridman, glass-worker, 87
Ringgold, Major, 435
Rink, John, 155
Rink, Stanger & Co., 155
Ringwald, Henry L., 340
Ritchie, Craig, 404
Ritchie, John, 404
Riverside Glass House, 403
Riverside Glass Works, 418
Robert E. Lee, 440
Robert Fulton, 431 *et seq.*
Roberts, Jacob, 225
Roberts, Joseph, Jr., 145
Robertson, Morgan, 340
Robinson, Enoch, pressing-machine invented. 264-278
Robinson, George W., 383, 441
Robinson, John, 35, 339, 341, 441; authentic specimens, 340
Robinson, S. G., 404
Robinson, Anderson & Co., 339
Roby, Luther, 370
Rochefoucauld-Liancourt, Duc de la, 175
Rochester, N. Y., glass factories, 34
Rock-crystal, 4
Rock Glass Works, 383
Rogers, Robert, 251
Rolfe, John, 58
Roman Empire, 13
Rome, N. Y., 232, 233; cutting methods, 15; development of industry, 15

Root, Nathaniel, 197
Rose, James, 252
Rosenbaum, John G., 222, 355
Ross, Elija, 373
Ross, James, 215
Rotterdam, 119
Rowland, James, 145, 146
Royall, Mrs Anne, 314
Rugg, Harold, 327
Rules and Regulations for Sword Exercise of Cavalry, Robert Hewes, 162
Rum, 50
Roundels, 49, 70
Rutherford, Thomas, 417

Sack, Israel, 38
Sacramento, Cal., 346
St. Louis, Mo., 422
Salade, Frederick, 228
Salem, Massachusetts, 9, 193, 431, 432; crops, 64; early settlers, 63; exports, 64; fisheries, 63; glass-making, 64, 101; imports, 64
Salem, N. J., 356
Salisbury, James, 323
Salisbury Glass Co., 237; specimens, 237
Salisbury, Vt., 236
Saltpeter, 6, 284, 313, 395
Salts, 123
Samuels, glass-maker, 361
Samuels, A. R., 441
Sanborn, George H., 370
Sand (*see* Silica)
Sander, John, 166
Sand Lake, N. Y., 164, 168; prosperity of works, 170
Sandstone, 7
Sandusky, Ohio, 250
Sandwich glass, 282; Bohemian imitations, 288, 291; candlesticks, 294; colored ware 288, 294, 295; decoration, 288; diversity of type, 288, 299; existing, 349; handicap in listing, 292; identification, 267, 269, 295; lamp designs, 293; list of wares, 291; models, 349; output, 267; quality, 267, 295, 333; stopper specimen, 292; tableware, 260, 285, 294; test specimens, 293; tumbler output, 294
Sandwich, Mass., 283
Sandys, George, 60, 61
San Francisco, Cal., 346
Saracens, glass-making, 14
Saranac river, 234
Saratoga glass, 229 *et seq.*
Saratoga Springs, N. Y., 231, 233
Saratoga Village, N. Y., 230
Savannah, Ga., 439
Saw Mill Run, Pa., 318
Scandinavia, 35
Scattergood, Haverstick & Co., 222
Schaefferstown (*see* Womelsdorf)
Schaffer, J. C., mold-maker, 34
Schaum, Frederick, 299
Schaum, F. & L., 300, 301
Schuam, Lewis, 299
Schetter, Frederick K., 299
Schmauss & Co., 235
Schmertz & Quinby, 251
Schoolcraft, Henry R., 236, 242, 244, 246, 441
Schoolcraft, Captain Lawrence, 242
Schuette & Co., 344
Schuylkill Glass Works, 151
Schuylkill river, 151
Schuylkill River Glass Works, 210
Scott, John, 287
Scott, John H., 227
Scott & Rapp, 362
Scott's Glass Works, 215
Scripture, Gillman, 366 *et seq.*
"Scroll," design, 417 *et seq.*, 443; collection of varieties, 409; colored, 445
Scull, Richard, 336
Sea Witch, 440

Sentinel, Easton (Pa.), 228
Seville, Spain, 16
Sewickley, Pa., 312
Shaffer, Frank, 200, 406
Shaffer, William, 200, 406
"Sheaf of grain, large tree," design, 445
"Sheaf of Rye," design, 224
Shearman (Sherman), Daniel, 189
Sheehan, Mrs. Eliza, 230
Sheetglass, German, 5
Shepard, Joseph, 373, 377
Shepard & Co., 373
Shepard & Co., J., 375
Shinn & Co., 408
Shipping, American, 63, 250, 258
Shooting Star, 440
Shough, William, 221
Shreve, Samuel, 225
Sidonians, glass-making, 13; molds, 26
Sign of the Duke of Cumberland, The, 109
Sikes family, 190
Silica, 164, 284, 334; best beds, 7, 82, 187, 189, 227; Berkshire, 396; compound, 3; cores, 26; Delaware deposits, 274; Demerara, 274; grades, 168, 186, 193, 197, 368, 369; Hancock, 385; impurities, 7; Oneida lake, 232; Scioto, 379; sources, 380; varieties, 4, 7; Virginia, 52 *et seq.*
Simmerman, Matthias, 354, 358, 360
Simons, Hendrickje, 73
Simpson, Lake & Stanger, 350
Sinnott, Thomas W., 153
Sizer, Horace, 383
Slagor Run, Ohio, 376
Slavery, American, 58
Sloanville, N. Y., 168
Smedes, Johannes, 67 *et seq.*, 94; name changed, 69; output of factory, 70
Smith, Benjamin, 358
Smith, Frederick, 240
Smith, Gideon, 221
Smith, Horatio, 368
Smith, Jesse, 186
Smith, Captain John, 52 *et seq.*, 55
Smith, Peter S., 232
Smith & Wilkins, 240
Snap-case invention, 40
Snowdon, John, 287
Soda, 4, 7; ash, 8; bicarbonate of, 397; carbonate of, 8; lime, 396; nitrate of, 8, 284, 334; sesquicarbonate of, 1, 2
Sodium, 10
Solomon, Nathaniel, 221
Sodium, 10
Solon, William, 232
Solvay, Ernest, 8
Somers, Sir George, 52
Somerville, Mass., 411
Somerville, N. J., 293
South America, 8, 399
South Ferry Flint Glass Works, 412
South Ferry Glass Works, 411, 412
South Jersey Glass, 16, 37 *et seq.*, 180; authentic specimens, 156; characteristics, 96; colors used, 98 *et seq.*; confusion of identification, 351; decorative forms, 97; early output, 100; importance, 152; kinds, 219; technique, 96, 117, 220, 234, 369; traditions, 223; Whitney bottles, 156 *et seq.*; (*see also* Glassboro works)
South Lyndeboro, N. H., 370
South Stoddard Works, 368
South Stoddard, N. H., 367
South Wheeling Glass Works, 394
Southwick, Lawrence, 64, 66
Southwick, Reed & Co., 234
Sowder, glass-worker, 87
Spain (*see* Spanish glass)
Spalding, Simeon, 186

Spanish glass, centers of industry, 16, 63; decline, 16; production, 16; quality, 16
Spargo, John, 237 *et seq.*
Spence, W. F., 373
Spencer, Jared, 195
Sprague, Nathaniel, 242, 244
Springfield, Mass., 190
Spring Garden Bottle Works, 301
Spring Garden Works, 198, 301 *et seq.*, 444
Spun glass, 13
Spurr, Charles W., 296
Spurt, Henry V., 289
Squankum, N. J., 358
Stadler, Rush & Co., 169
"Stag," design, 428, 435
Stanger, Adam, 152
Stanger, Christian, 152
Stanger, C. L., 222
Stanger, Daniel, 152, 153
Stanger, Elizabeth Marshall, 363
Stanger, Francis, 152, 153
Stanger, Frederick, 220, 357, 363
Stanger, George C., 352
Stanger, Isabella, 363
Stanger, Jacob, 152, 221, 351 *et seq.*
Stanger, John, 152, 415 *et seq.*, 420
Stanger, Julius, 363
Stanger, Lewis, 155, 351 *et seq.*
Stanger, Peter, 152, 153
Stanger, Philip, 152, 153
Stanger, Solomon, 152, 153
Stanger, Thomas, 363
Stanger, Thomas W., 353
Stanger, William, 221
Stanger & Son, Lewis, 352
Stanger family, Glassboro works, 153 *et seq.;* glass-makers, 152 *et seq.;* last members in business, 155; number of sons, 152; numerous failures of, 352; outside partners, 153, 154; variations in name, 152
"Star-and-feather," design, 326
Stebbins, Thomas, 187, 196, 442; first portrait-flasks, 197; markings, 197; "patriotic," bottle idea, 258
Stebbins & Chamberlain, 196
Stedman, Alexander, 119
Stedman, Charles, new interests, 121; partner of Stiegel, 119, 127; property mortgaged, 127, 129
Steelman, Harry, 365
Steel molds, 26
Stephens, DeWitt C., 410
Stetson, Captain William, 287
Steubenville, Ohio, glass houses, 261, 385 *et seq.*, 387
Steuben works, 40
Stevens, H. H., 383
Stevens, James, 265
Stevens, Crandall & Co., 412
Stewart, A. L., 112
Stiegel, Anthony, 119, 120, 133
Stiegel, Dorothea Elizabeth, 118
Stanger, Frederick, 96
Stiegel, Henry William, 50, 95, 114, 131, 147, 179, 294, 403; agencies, 123; arrived in America, 119, "baron," 126; break with Stedmans, 127; church interests, 120, 130; death, 134; European study, 121; extravagance, 124 *et seq.;* first factory, 81, 120; furnaces, 18, 217; German birth, 118; imprisoned for debt, 132; ironmaster, 119; last years, 133; letters, 132; loss of second wife, 133; lottery promoted, 131; marriage, 119; molds, 28; mortgage manipulation, 128; mother's death, 133; naturalization, 119; new glass-works, 127; New York store, 129; opportunity, 91; output, 259; peculiarities, 126 *et seq.;* processes, 29; property acquired, 121; records, 92; retail shop, 123; second mar-

Stiegel, Henry William—*Cont'd* riage, 121; trade name changed, 130; wholesale business, 123; wife's death, 121; (*see also* Stiegel glass)
Stiegel, John Frederick, 118
Stiegel glass, blown flint, 40; bottles, 404; characteristics, 126; colors achieved, 126, 141; demand for, 129; distribution, 123; enamel ware, 138; flint-glass, 129; forms, 96; identification difficult, 327; output, 140; prices, 123; quality, 113, 126, 135, 179, 180; specimens, 138, 139; tableware, 130, 139
Stillman, Edward, 386
Still, William, 200
Stimley, Jacob, 377
Stinger, F., 423
Stinger (Stanger), Solomon, 423
Stoddard, N. H., glass works, 33, 366 *et seq.*, 441; specimens, 368
Stone, F. D., 76
Stourbridge clay, 19, 89
Stourbridge Glass Works, 339
Stourbridge, England, 213, 339
Stow, Charles M., 295
Stratton, Nathaniel L., 354
Stratton, Buck & Co., 355
Strickland, engraver, 228
Stryker, Jacobus, 73
Stuyvesant, Peter, 68, 73
"Success to the Railroad," design, 445; colored, 445
Sullivan, Samuel, 372
Sulphuric acid, 269
Sun, effects on glass, 9
"Sunburst," design, 195, 248, 445; colored, 445
Suncook Glass Works, 369
Suncook, N. H., 186, 369
Sussel, Arthur, 37
Sutton & Wendt, 337
Suydam, glass-maker, 234
Swan, Edward, painter, 287
Swansey, Patrick, 286
Sweeney, Michael, 28, 394, 404; chilling process invented, 398
Sweeney, M. & R. H., 394
Sweeney, R. H., 394, 404
Sweeney & Co., 398
Sweeney, Bell & Co., 398
Sweeney, McCuney & Co., 398
Sweeney & Sweeney Glass Co., 394
Swindell, Walter B., 298 *et seq.*, 304
Swindell, William, 300; blower at Excelsior, 363; in coöperative group, 301; manager at Federal Hill, 302; specimens, 304
Swindell Brothers Glass Works, 298
Switzerland, enameled glass, 138
Swope, John, 358, 359
Syria, glass industry, 13

Tabal, glass-worker, 87
Tableware, 69, 100, 120, 220, 222, 252, 276, 315, 349, 381, 385, 395, 406; Albany, 167; Amelung, 178; blown-glass, 75, 137, 169, 345, 386, 404, 423; colored, 113, 139, 358; Connecticut, 200; covered dishes, 16; cut glass, 137, 414; demand for, 209, 326, 386, designs, 326; enameled, 138; English wine-glass, 136; flint-glass, 375; glass unknown, 46; Greensboro, 206; imitation of European, 260; imported, 80; jars, 16, 380; Jersey City, 353; Lyon services, 335; miniature, 419; mugs (*see* separate item); need for, 184; New Jersey, 361; pewter, 46; Pittsburgh output, 268; pressed-glass, 279, 326, 347, 386, 387; prices, 123; production, 35; quality, 7; ribbed pitchers, 329; Robinson, 339; Salisbury, 238; salt-cup, 421; "salt" designs, 330; Sandwich,

Tableware—*Continued*
285, 291; Saratoga, 229, 230; specimens, 375; Stiegel, 128, 131, 135, 139, 140; tumblers (*see* separate item); vinegar-cruets, 330; wooden, 46; Zanesville types, 374, 378
Tansboro, N. J., 354
Taylor, Dent, 405;
Taylor, James, 376, 416, 420
Taylor, John, 11, 249
Taylor, Zachary, 304
Taylor & Co., James, 441
Taylor & Co., John, 249
Taylor flask, 34
Taylor, Stanger, Ramsey & Co., 416
Temperance Village, Pa., 318
Temperanceville, N. J., 351, 352
Temple, N. H., 181; authentic glass specimens, 163; glass works, 159 *et seq.*
Ten Eyck, Abraham, 166
Tewkes, Benjamin, 287
Thackara, Benjamin Y., 354
Thames River Glass Co., 198
"Thistle" design, 341, 435
Thomas, David, 379
Thomas, Walter R., 359
Thompson, Benjamin, 87
Thompson, Zodock, 238
Thomson, manager at Boston, 184
Thorne, Isaac, 155
Thorpe, General, 60
Thothmes III, King, 14
Three Mold Glass, Helen A. McKearin, 30
Thurston, George, 216
Tice, Clayton B., 226, 361, 364
Tice, Richard H., 226, 358
Tice, Samuel P., 358
Tiles, 378
Tinker, Jonathan, 381
Tittery, Joshua, 75
Tobacco cultivation, 58
Toledo, Ohio, 16, 281; Art Museum, 62
Tomlinson's Tavern, 204
Tonkin, Samuel, 153
Tools, 19 *et seq.*, 29; snap-case, 438
Topsfield, Mass., 64
Torreyson, Irish glass-maker, 403, 418
Towars, Robert, 144
Townsend, Charles, 220
Townsend, Isaac, 221
Townsend, Mr., M. P., 81
Townsend, Samuel, 220
Townsend Act, 81; repealed, 144
Trader's Society, 75
Travels of America, John Mellish, 379
Tree of Liberty, 205
Tripoli, 14
Troy, N. Y., 234, 239; Farmers' Bank, 236, 239
Trumbull, 203
Tsaou-tsaou, 15
Tuckahoe river, 221
Tuel, Benjamin, 188
Tumblers, 380, 386, 411; blown, 345; crude, 385; cut-glass, 414; flintware, 422; first pressed-glass article, 286; molds needed, 26; Pittsburgh prices, 314; Robinson, 339; wine, 411, 413
Turner, Gilbert, 199
Turner, Samuel, 373
Tuscarawas river, 259
Tuttle & Gaffield, 183
Twain, Mark, 415
Twitchell, Timothy, 242, 244
Tyre, 14

"Union" designs, 251, 343
"Union and Clasped Hands" design, 445; colored, 445
"Union-Eagle" design, 321, 346, 350
Union Glass Co., 198, 405, 442
Union Glass Factory, 220

Union Glass Works, 293, 411, 434
United States, Census Report, 1840, 218; chain-store development, 250, 290; congressional investigation of prices, 314; competition with England, 275; customs, 427; demands for glass, 176; English embargo on manufactures, 160; Erie canal opened, 406; expansion era, 257 *et seq.*, 326, 337; financial instability, 257, 261, 325, 359, 396; first glass-works after Independence, 159; first railroad, 305; first tariff act, 175; freight rates, 261; largest factory, 344; middle-west district, 318, 372; patents contested, 278; shipping, 284; railway building, 260, 284, 305, 408; tariff on glass, 246; tea-drinking, 427; town names, 261; trade routes, 259, 383, 389; transportation rates, 285; westward migration, 259 *et seq.*, 326, 382; (*see also* America)
United States Gazette, Philadelphia, 231
Utica Glass Works, specimens, 233
Utica, N. Y., 232, 233
Van Dam, Rip, 229
Vanhook, Samuel, 254
Vankirk, John J., 228
Van Rensselaer, Jeremiah, 166, 168
Van Rensselaer, K. K., 166
Van Rensselaer, Stephen, 37, 40, 163, 168, 195, 247, 299, 305, 408
Van Ruyven, Corlears, 73
Van Twiller, Wouter, 67
Vaughan, Malcolm, 152
Venetian glass, 16, 45, 46; beauty, 135; bottles, 438; composition, 4; decline, 17; exportation, 17; imitations, 280; methods secret, 17; Murano, 17, 135; patterns, 135; quality, 17; segregation of workers, 17
Vermont, glass-making, 236 *et seq.*
Vermont Glass Factory, 240; currency issued, 236; failure, 237; success, 236; *Vesuvius*, 440; Vials (*see* Bottles); *Village Herald*, 155; Vincenzo, Venetian glass-blower, 60, 61
Vineyards, and development of glass, 49
"Violin" design, 417 *et seq.*, 443; colored, 445
Vernon, N. Y., 232, 233
Virginia, 52; charter, 52; crops, 59; first English girls, 58; gentlemen adventurers, 53; glass-making, 54; Jamestown, 53; massacre, 61; natural resources, 55; royal province, 62; sand beds, 53; settlement, 53; Venetian glass-blowers, 58
Virginia Works—Knox & McKee, Wheeling, 390
Vitro-di-trina, 17

"Waffle" design, 326
Walden, Anton, 120
Waldo, N. J., 354
Walker, Thomas E., 412
Wall, A. J., 108
Wallace, partner of James Lyon, 331
Wallace, Giger & Ensell, 397
Wapler, Charles W., 362
War of 1812, 182, 189, 196, 215, 253, 435
Warren, Sir Peter, 107, 110
Warren & Co., 198
Warrick, H. S., 353
Warrick, J. Price, 353
Warrick, T. D., 353
Warrick, Woodward, 352, 358
Warwick, Mass., 188

Washington, George, 203, 208, 252, 317, 435; Amelung glass service presented to, 176; bottle, 304; interest in American glass-making, 176; Masonic Lodge, 176; real estate development, 202
Washington, Lawrence, 202
Washington, Mass., 189
Washington flask, 34, 148
Washington, 440
Washington City Glass Works, 423
Washington Glass Works, 359
Washington, D. C., glass works 205, 423
"Washington-Eagle" design, 375
"Washington-Taylor" design, 407; colored, 445
Waterford Glass Works, 225; output, 226; rare flasks, 227
Watson, Daniel, 242, 244
Watson, Elkanah, 165, 166, 168
Watson, Mark, 216, 321
Way, Andrew, Jr., 423
Way, George, 423
Wayne, Anthony, 208
Weber, glass-maker, 370
Webster, Daniel, 183
Weekly Post-Boy, 110, 111
Weeks, Joseph D., 75, 213, 216, 311
Weeks, Luman, 367
Weeks & Gilson, 366, 368
"Weeping Willow" design, 224
Weil, Henry V., 38
Wells, George H., 251, 383
Wellsburg, W. Va., glass works, 401 *et seq.*
Wells, Henry & Co., 387
Welsh, Joseph, 137, 138
Wendt, George, 215, 373
Wenham, Mass., 64
Wentzell, John William, 86
West, Dr. James Herbert, 409
Westcoat, Richard, 188
Westford Glass Works, 33, 199
Westford, Conn., 199, 406
West Indies, 399; West Virginia, 36, 142; glass works, 8, 374, 389, 394; "Panhandle," 401; sand beds, 7
"Westward-Ho" design, 327
West Willington Glass Works, 199
West Willington, Conn., 199
Wetherell, Samuel P., 220
W. F. & Sons, 444
Whalley, Samuel G., 175, 181, 183
Wheat, Price & Co., 391
Wheeler, Quincy, 245
Wheeler, Sumner, 245
Wheeling, W. Va., 204, 238, 259, 279, 286, 312, 376, 399, 442; early promise, 389; glass houses, 389 *et seq.*, 394 *et seq.*
Whipple, John, 189
Whitaker, Lieutenant, 59
Whitall Brothers & Co., 222
White, Harry Hall, 414
White, H. S., 235
White Glass Works, 372 *et seq.*; changing ownership, 373; founders, 376; output, 374; quality, 377; rare specimens, 377
Whitehead, glass-maker, 337
Whiting, Amos, Jr., 186
Whitney, Eben, 155, 352
Whitney, Henry, Jr., 280
Whitney, Samuel, 155
Whitney, Thomas H., 155, 352
Whitney Brothers, 155, 222, 352; bottle types, 156 *et seq.*; output, 156
Whiton, John M., 366 *et seq.*
Whorley, Henry, 130
Wickoff, Peter, 154
Wightman, Thomas, 318, 319, 320
Wightman & Co., Thomas, 319
Wilcoxen, O. S., 232
Wilkins & Landon, 240
"William Henry Harrison," design, 445

Williams, Ebenezer, 188
Williams, Roger, 63, 66
Williams, Roger, mold-maker, 34
Williams, S. H., 201
Williams, Stacy, 34
Williamsport Glass Works, 337
Williamsport, Pa., 320, 337
Williamstown Glass Mfg. Co., 359
Williamstown, N. J., 358
Willington Glass Company, 33, 199, 200
Willington, Conn., 406
Willis, Stephen, 221
Wills creek, 258
Wills mountain, 274
Window-glass, 48, 65, 74, 90, 120, 151, 154, 187, 200, 204, 214, 222, 223, 241, 305, 342; Albany output, 167, 169; Amelung, 178; annual output, 231; Baltimore, 298, 304; demand for, 209, 326; demand for Boston, 182; importance of making, 80; increased size of pane, 342; need for, 184; New Jersey, 219; new process, 338; Ohio works, 376; Pennsylvania, 252; pioneers in industry, 323; Pittsburgh, 212; shortage of workmen, 145; substitute for, 76; Vermont, 236; Wistar, 91; Zanesville production, 378
Wine, effect on glass industry, 45
Wingfield, Edward Maria, 52
Winslow, Isaac C., 421
Winslow, N. J., 219, 356
Wisconsin, O'Hara estate, 209
Wiseland, Philip, 123
Wistar, Caspar, 107, 153, 179, 218, 220; button-maker, 84, 87; death, 87; emigrated to America, 84; foreign competition, 90; glass works, 86; real estate purchased, 85; records lacking, 95; reported to England, 87; workmen imported, 86
Wistar, Caspar II, 87
Wistar, C. E., 217
Wistar, Johannes Caspar, 84
Wistar, John, 94
Wistar, Richard, 85, 91, 95, 217; button-maker, 91; death, 94; increased activity, 87; property for sale, 93; success, 107; varied output, 99; works left to, 87; wrecked by war, 93
Wistarberg and South Jersey Glass, George S. McKearin, 36
Wistarberg Glass Works, 36 *et seq.*, 75, 95, 153, 217; authentication 95; colors produced, 98
Witmer, Sebastian, 137, 138, 139
Wolf, David, 154
Wolfa (Walfahert), Ferdinand, 164
Wolf, Hard & Co., 349
Womelsdorf, Pa., 133; iron works at, 121; Jewish settlement, 125; Stiegel castle, 125
Wood, John B., 245
Wood, as fuel, 6, 22, 55, 85, 113, 121, 197, 235, 283, 303, 408; molds, 26
Woods, Almon, 367
Woodstock, N. Y., 232
Woodward's Tavern, 382
Wooster, Ohio, 384
Workmen, 382; American, 95; apprentices, 289, 325, 342; Belgian, 86; blowers, 22, 85, 120, 149, 210, 233, 415; blowers' assistants, 254; Bohemian, 423; death due to heat, 93; demand for, 243; Dutch, 68, 87, 90, 113, 164; English, 121, 135 *et seq.*, 287, 307, 313, 333; European law regarding, 168; French, 333; German, 84, 101, 103, 135 *et seq.*, 173, 181, 333; habits, 149; Hessian deserters, 160 *et seq.*, imported, 85, 103, 113, 117, 169, 174, 333; indentures broken,

Workmen—*Continued*
233; intemperance among, 188; Irish, 316, 333; Italian, 60, 135; itinerant, 82; mold-makers, 28, 34; New Jersey, 194; pressing-machine hated by, 265; prosperity, 301; Scotch, 169, 307; severity of work, 123; shortage of blowers, 210; strikers, 290, 347, 362; Venetian, 121; wage offers, 422; wage scales, 124, 226, 287, 294; westward migration, 210
Wormser & Co., E., 441, 444; colors produced, 346; quality, 347; stamp mark, 346; "Union" design, 343
Wormser Glass Company, Ltd., E., 346
Wu-Ti, Emperor, 15
Wyckoff, Jacob C., 219
Wyncoop, Dr. Herman G., 231

Yarnall, glass-maker, 361
Yetters, Joseph, 137; special designs, 138
York, Pa., 120, 123
Youghiogheny river, 252, 253
Young, William, 338
Young, Ihmsen & Plunkett, 338

"Zachary Taylor," design, 442, 445
Zanesville Glass Works, 444; bottles, 404; designs originated, 374 *et seq.;* stamp marks, 374
Zanesville, Ohio, 293, 443; glass houses, 372 *et seq.;* McIntyre Inn, 372
Zelley, Martha, 321
Zing, Frederick A. de, 166
Zing, William de, 233